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NORTHERN NIGERIA.

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ANNUAL

MEDICAL AND SANITARY REPORT

FOR THE YEAR ENDING

31ST DECEMBER, 1911.

LONDON :

WATERLOW & SONS LIMITED, PRINTERS, LONDON WALL.

1912.

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NORTHERN NIGERIA.

ANNUAL MEDICAL REPORT

FOR THE YEAR ENDING

31ST DECEMBER, 1911.

(I.) ADMINISTRATIVE.

STAFF.

Table I. of the Returns gives a complete list of the Medical Staff and the principal members of the Subordinate Staff.

The principal changes, promotions, and other items of interest are as follows :—

Dr. S. W. Thompstone, C.M.G., Principal Medical Officer, retired on pension, Dr. J. P. Fagan, Deputy Principal Medical Officer, being appointed to the vacancy.

Dr. F. Manning, Senior Medical Officer, was appointed Deputy Principal Medical Officer.

Dr. E. A. Chartres, Senior Medical Officer, was transferred to the Gambia, and Dr. C. E. S. Watson, Senior Medical Officer, to the Northern Territories of the Gold Coast.

Drs. C. F. Watson and W. H. Gordon Hall were promoted to be Senior Medical Officers.

Dr. H. G. Lewer died from Blackwater Fever on the River Gongola whilst proceeding to his station on return from leave.

Dr. D. Alexander was transferred to Sierra Leone as Sanitary Officer in January, and Dr. H. W. Gush was transferred to the Gold Coast for duty.

The new Medical Officers posted to the staff during the year were Drs. H. C. Jeffreys, A. J. M. Crichton, L. W. Davies and B. J. Courtney.

Drs. R. Willan and D. Le Bas were employed on the Baro-Kano Railway, and Dr. A. J. M. Crichton on the Bauchi Light Railway.

Professor J. J. Simpson was accompanied by Dr. J. W. Scott Macfie (W.A.M.S.) during his entomological survey of the Guarara river district, and through the Bassa country south of the Benue. Dr. Scott Macfie's report was sent to the Sleeping Sickness Bureau.

FINANCIAL.

Table II. is a statement of expenditure incurred by the Medical Department.

The Revenue derived from Hospital Fees during the year was ...	... 675	£ s. d.
And from the sale of Medical Comforts ...	118	2 0
Making a total of ...	£793	8 1

Showing an increase of £29 8s. 6d. over the previous year.

(II.) PUBLIC HEALTH.

GENERAL REMARKS.

The health of the European and Native population has been, on the whole, fair. Amongst Europeans there were 13 deaths during the year, seven being officials and six non-officials. The causes of deaths were:—Blackwater Fever, 5; Erysipelas, 1; Peritonitis, 1; Drowning, 1; Pleuritis, 1; Malaria, 1; Colitis, 1; Cardiac Failure, 1; Beri-Beri, 1. (The case of Beri-Beri was not attended by a Medical Officer at the time of death.) A death from Blackwater Fever occurred at Jebba, amongst the Southern Nigerian officials of the Northern Extension of the Lagos Railway, and is not included in these statistics.

The appended tables of analysis give the comparison regarding deaths and invalidings with previous years.

	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Average European population ...	309	322	342	347	424	499	544	637	641
Number of deaths ...	18	13	10	17	7	10	13	13	13
Death rate per 1,000	58.25	40.37	29.23	48.99	16.50	20.04	23.89	20.41	20.28
Number of invalids	43	67	49	55	50	48	67	48	40*
Invaliding rate per 1,000 ...	139.15	208.15	143.27	158.5	117.92	96.19	123.16	75.35	108.40*

* Officials only.

Under the heading of general and communicable diseases, asked for in the "Model Medical Report," these diseases have been, as in the last Annual Report, fully dealt with by the Senior Sanitary Officer.

A special report on Blackwater Fever has already been furnished for transmission to the Secretary of State, but the appended list of cases shows the comparison with previous years.

	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.
Number of cases ...	17	35	18	25	12	14	13	9	12
Rate per 1,000 of average population	54.69	108.69	52.63	72.04	28.32	28.05	23.89	14.12	18.72
Number of deaths ...	8	6	4	5	0	4	3	2	6
Case of mortality per cent ...	47.05	17.14	22.2	20.0	—	28.57	23.07	22.2	50.0

EUROPEAN OFFICIALS.

(Heading "b" in Model Medical Report.)

Forty European officials were invalidated during the year. Twelve of these invalidings were not due to climatic causes; the remainder were, either directly or indirectly, due to the effects of climate.

Two officials were sent home to undergo the Pasteur Treatment, having been bitten by a dog suspected of Rabies—both patients have returned to the Protectorate and are now performing their duties.

TABLE SHOWING THE SICK, INVALIDING, AND DEATH RATES OF EUROPEAN OFFICIALS.

			1910	1911
Total number of officials resident	...	...	—	—
Average number resident	...	...	424	369
Total number on sick list	...	...	—	861
Total number of days on sick list	...	...	—	7,108
Average daily number on sick list	...	...	—	19.4
Percentage of sick to average number resident	...	...	—	233.3
Average number of days on sick list for each patient	...	...	—	8.25
Average sick time to each average resident	...	...	—	19.2 days
Total number invalidated	...	...	31	40
Percentage of invalidings to average number resident	...	...	7.3	10.84
Total deaths	...	...	7	7
Percentage of deaths to total residents	...	...	—	—
Percentage of deaths to average number resident	...	...	1.65	1.89
Number of cases of sickness contracted away from residence	...	—	—	—

NATIVE OFFICIALS.

A separate return for Native officials was not brought into use until the middle of the year; the statistics have, therefore, been included under "General Native Population." Arrangements have been made for a future separate return under this heading.

GENERAL EUROPEAN POPULATION.

The average European population during the year was 641, viz., 616 males and 25 females; 369 official and 272 non-official. This does not include 79 Lagos Railway officials resident in Northern Nigeria.

It has, so far, been impossible to obtain reliable statistics. There is now a large mining community, with their own medical men, who have not been in the habit of making any returns, except in the event of deaths, which have to be officially dealt with by the Political officers.

GENERAL NATIVE POPULATION.

The official estimate of the population for the year was 9,269,000.

Arrangements are now being made by the authorities to supply birth and death rate returns from all the large cities to this department for registration. Registration has not, so far, been compulsory in the Protectorate.

(III.) SANITATION.

A full report, including, as far as possible, the returns asked for under this heading, is attached from the Senior Sanitary Officer, in which, as in his report of 1910, he deals exhaustively with the epidemic and insect-borne diseases of the country.

I would like to call special attention to his remarks generally on the subject of :—

- (a) Increased accommodation for both European and Native officials — which accommodation is, at the present time, most inadequate.
- (b) Local, instead of central, control for the segregation of Lepers and Sleeping Sickness patients; the question evolved thereby of developing a costly poor-law system.

The outlay for the upkeep of pauper patients in the various stations is increasing each year and threatens to become a serious item in the expenditure. Legislation in this matter is urgently required. During the year 3,943 paupers were treated at the expense of the Government.

(IV.) METEOROLOGY.

Table IV. gives detailed monthly meteorological returns from 18 stations. The instruments used and returns furnished are accepted as reliable by the Meteorological Society.

Highest temperature in the shade	119° F.	at Geidam, March 28th.
Lowest , " , " , "	43° F.	at Kano, December 30th.
Highest mean shade temperature	83.8° F.	at Baro.
Lowest , " , " , "	73.0° F.	at Naraguta.
Greatest rainfall (annual total) , ...	57.84"	at Naraguta.
Greatest rainfall on one day , ...	4.53"	at Naraguta, 21st May.
Lowest rainfall (annual total) , ...	10.46"	at Geidam.
Greatest range of temperature , ...	72° F.	at Geidam : 119-47.

(V.) HOSPITALS AND DISPENSARIES.

There is an European hospital at each of the following stations :—

Zungeru , ... , ...	12 beds.
Lokoja , ... , ...	12 beds.
Baro—Temporary during railway (Baro-Kano) construction, and the Bauchi Light Railway in course of construction to Rahamma in the tin-mining districts.	

In the future it is more than probable that the advent of the railway, with the accompanying increase in European residents (traders, miners, etc.), will cause considerable changes to become necessary with regard to the locality, size, and staffs of the present hospital arrangements.

IMPROVEMENTS.

The closing in of the wards of the Lokoja Hospital with mosquito gauze netting has not been a complete success, the patients complaining of the

increased heat and lack of air during the daytime. The only remedy for this would be the use of electric fans. In the Zungeru Hospital the patients still use the ordinary mosquito net. At Baro Hospital the experiment was tried of building a small mosquito-proof room in each ward which could be occupied by a patient if necessary, but this plan was little improvement on the shutting in of the whole ward.

Native hospitals are at the following stations :—

Zungeru 48 beds.

Lokoja 52 beds.

Baro—temporary for Baro-Kano Railway construction.

At other stations hospitals, European or native built, are provided where necessary.

RETURN OF DISEASES.

Complete Nosological Tables (Tables V. and VI.) are attached giving the diseases which occurred throughout the Protectorate.

(VI.) SCIENTIFIC.

Patrols and tours of inspection have been made throughout the year by the Medical Officers in the various districts, and constant inquiries made concerning the various outbreaks of epidemic disease; tse-tse fly districts have been located, and, where possible, the necessary clearing of roads and the banks of streams have been carried out. Reports, and any specimens of interest, have been sent home to the various bureaus.

F. MANNING,

Acting Principal Medical Officer.

ZUNGERU,

NORTHERN NIGERIA,

18th July, 1912.

TABLE I.
MEDICAL STAFF.

Appointment.	Name.
Principal Medical Officer... ...	J. P. Fagan.
Deputy Principal Medical Officer ...	F. Manning.
Senior Sanitary Officer ...	M. Cameron Blair.
Senior Medical Officer ...	E. W. Graham.
" " " ...	C. F. Watson.
" " " ...	W. H. A. Gordon-Hall.
" " " ...	H. A. Foy.
Sanitary Officer ...	F. W. Chesnaye.
Medical Officer ...	H. P. Lobb.
" " ...	E. C. Adams.
" " ...	B. Flood.
" " ...	W. H. Manuk.
" " ...	G. R. Twomey.
" " ...	A. C. Parsons.
" " ...	M. F. Ellis.
" " ...	H. G. McKinney.
" " ...	C. T. Costello.
" " ...	K. McGahey.
" " ...	G. B. Norman.
" " ...	J. M. Dalziel.
" " ...	R. F. Williams.
" " ...	W. D. Inness.
" " ...	A. J. T. Swann.
" " ...	G. J. Pirie.
" " ...	B. Moiser.
" " ...	C. W. McLeay.
" " ...	J. M. W. Pollard.
" " ...	W. A. Trumper.
" " ...	Captain F. E. Bissell.
" " ...	F. W. McCay.
" " ...	E. J. Porteous.
" " ...	R. Willan } For Baro-Kano Railway.
" " ...	D. Le Bas }
" " ...	J. Lindsay.
" " ...	J. W. Scott-Macfie.
" " ...	W. Morrison.
" " ...	P. C. Conran.
" " ...	H. C. Jeffreys.
" " ...	A. J. M. Crichton.
" " ...	L. W. Davies.
" " ...	B. J. Courtney.
Chief Dispenser and Storekeeper	G. C. W. King.
Male Nurse ...	J. W. Vincent.
One Staff Sergeant ...	{ Persons employed.
Nine Sergeants ...	
Ten Nursing Sisters ...	Miss M. A. Ward & Miss J. A. Clark, &c.
2 Second Class Dispensers ...	C. E. Roberts and one other.
1 Third Class Dispenser...	Person employed.
3 Third Grade Clerks ...	J. F. Eshon, S. M. Buckle and F. M. Sam.
12 Dressers ...	{ Persons employed.
2 Cooks ...	
7 Ward Servants...	
2 Messengers ...	
17 Dispensary Attendants ...	

TABLE II.
STATEMENT OF EXPENDITURE.

MEDICAL DEPARTMENT.

		£
1	Principal Medical Officer at £1,000 to £1,200 by £50	1,200
	Duty Pay at £200...	200
1	Deputy Principal Medical Officer at £800 to £900 by £25	825
	Duty Pay at £160...	93
4	Senior Medical Officers at £600 to £700 by £25	2,644
	Duty Pay for $2\frac{2}{3}$ at £120...	320
20	Medical Officers at £500 to £600 by £25	10,910
14	Medical Officers at £400 to £500 by £20	6,253
	Active Service Allowance to Medical Officers on Expeditions at 10s. per diem.	50
—	Share of Salary of 1 Medical Officer on special duty in the Colonial Office	122
1	Chief Dispenser and Storekeeper at £300 to £350 by £10	310
1	Staff Sergeant at £162—Staff Pay at £24	190
1	Male Nurse at £180 to £250 by £10	250
6	Sergeants, 1 at £146, 1 at £145, 4 at £144	867
—	Staff Pay to 2 Sergeants at £24	48
10	Nursing Sisters at £100 to £150 by £10	1,125
	Duty Pay of 2 Nurses in Charge at £20	40

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		£
—	Field and Ration Allowances	1,492
2	Second Class Dispensers at £100 to £150 by £10	247
1	Third , , , £80 to £100 by £5	88
3	Third Grade Clerks at £88 to £116 by £4	318
12	Dressers at £24 to £36 by £3	362
2	Cooks at £42	84
7	Ward Servants at £18	126
2	Messengers at £12	24
2	Headmen of Ambulance at 1s. per diem.	37
24	Ambulance Bearers at 10d. per diem	366
18	Dispensary Attendants at Outstations at £1 per month	216
—	Total	<hr/> £28,807

Other Charges.

		£
Drugs, Instruments, and Appliances	...	1,200
Hospital and Camp Equipment	...	300
Medical Comforts	...	100
Hospital Diet and Provisions	...	500
Light, Fuel, &c.	...	50
Horse Allowance, $27\frac{1}{3}$ at 2s. 6d. p.d.	...	1,251
" , , , $5\frac{1}{3}$ at 1s. 9d.	...	171
Outfits for Subordinates R.A.M.C., 4 at £14	...	65
" , , , Nursing Sisters $6\frac{2}{3}$ at £12	...	80
" , , , Medical Officer, 1 at £12	...	12
Contribution to Southern Nigeria for Medical Officer at Burutu	...	60
Carried forward	...	<hr/> £3,789

MEDICAL DEPARTMENT—*continued.**Other Charges—continued.*

	Brought forward ...	... £3,789
Medical examination of Officers in England	... ... ...	... 150
Expenses of N.C.O.'s and Nurses travelling in England	... ...	25
Scientific Instruments and Appliances	... ... ...	60
Expenses of Medical Officers and Nurses at Tropical School and fees on engagement of Nurses	... ... ... ...	86
Refund to Medical Officers of fees for courses of study for promotion	... ...	280
Expenses in connection with Isolation Hospitals	... ...	20
Vaccination Expenses	... ... ...	200
Expenses in connection with Research work	... ...	20
Extra Medical Assistance	... ... ...	40
Medical Research Institute, Lagos—		
Construction	... ... ...	70
Maintenance	... ... ...	230
Fees to Medical Officers for <i>post-mortems</i>	... ... ...	150
Expenses in connection with segregation of Lepers	... ...	500
Share of expenses of Travelling Entomologist for B.W.A. (Mr. Simpson)	... ... ...	150
	Total ...	... £5,770

SUMMARY.

		£
Personal Emoluments	... ... ...	... 28,807
Other Charges	... ... ...	... 5,770
	Total ...	... £34,577

SANITATION.

Personal Emoluments.

		£
1 Senior Sanitary Officer at £800 to £900 by £25	... ... ...	... 825
Duty Pay at £160...	... ... ...	... 93
1 Sanitary Officer at £600 to £700 by £25	... ... ...	... 613
Duty Pay at £120...	... ... ...	... 120
Sanitary Allowance to 3 Medical Officers at £50	... ... ...	... 150
Field Allowance 1½ at 5s. p.d....	... ... ...	... 122
2 Inspectors of Nuisances at £36	... ... ...	... 72
	Total ...	... £1,995

Other Charges.

		£
Horse Allowance 1½ at 2s. 6d. p.d....	... ... ...	... 61
Kerosene and Disinfectants	... ...	50
Laboratory Equipment and Upkeep	... ...	200
Sanitary labourers at Outstations...	... ... ...	... 300
	Total ...	... £611

SUMMARY.

		£
Personal Emoluments	... ... ...	... 1,995
Other Charges	... ...	... 611
	Total ...	... 2,606

TABLE III.

RETURN OF STATISTICS OF POPULATION FOR THE YEAR.

	Europeans and Whites.	Africans.	East Indians.	Chinese and Malays.	Mixed and Coloured.
Number of inhabitants in 1910 ...	637	...	...	...	...
Number of births during the year 1911 ...	—	...	...	...	...
Number of deaths during the year 1911 ...	13	...	...	...	...
Number of Immigrants during the year 1911	—	...	...	...	...
Number of Emigrants during the year 1911	—	...	...	...	...
Number of inhabitants in 1911 ...	641	...	...	...	...
Increase ...	4	...	...	...	...
Decrease ...	—	...	...	...	...

79 Officials of the Northern Extension of the Lagos Railway, employed in Northern Nigeria, are not included in the above return.

Now that the large and increasing mining population are settling down in the various tin-producing districts, and Medical Officers being appointed by the Chamber of Mines, it will be possible to obtain in the future reliable health statistics, which, up to this, it has been practically impossible to do, and steps are now being taken by the authorities to collect such returns.

TABLE IV.

METEOROLOGICAL RETURN FOR THE YEAR 1911.

MONTH.	ZUNGERU.					WIND.	LOKOJA.					WIND.		
	TEMPERATURE.			RAINFALL.	WIND.		TEMPERATURE.			RAINFALL.	WIND.			
	Shade, Max.	Shade, Min.	Range.				Mean.	Amount in inches.	Degree of Humidity.					
January ...	99	60	39	80.2	—	44	N.E.	96	60	36	81.1	.08		
February ...	103	65	38	83.9	—	31	”	101	61	40	83.5	—		
March ...	102	70	32	86.2	1.12	56	S.W.	100	67	33	84.9	3.59		
April ...	100	70	30	85.4	2.39	69	”	95	69	26	83.0	6.23		
May ...	99	68	31	81.3	7.06	76	”	94	68	26	81.1	3.04		
June ...	94	66	28	79.8	7.34	80	”	92	68	24	79.4	5.00		
July ...	92	68	24	78.8	2.86	82	”	89	67	22	78.9	3.03		
August ...	90	68	22	77.2	4.77	84	”	89	68	21	77.8	3.30		
September ...	92	68	24	78.9	13.64	85	”	91	68	23	79.2	11.22		
October ...	95	66	29	79.9	3.72	79	”	92	69	23	79.9	3.85		
November ...	96	54	42	79.0	—	59	S.W. & N.E.	95	64	31	81.0	—		
December ...	99	56	43	79.0	—	42	N.E.	94	59	35	77.1	2.23		
Year ...	103	54	49	80.8	42.90	66	S.W.	101	59	42	80.5	41.57		
												S.W.		

METEOROLOGICAL RETURN FOR THE YEAR 1911—*continued.*

MONTH.	TEMPERATURE.				RAINFALL		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade Max.	Shade Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade Max.	Shade Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January	98	45	53	74.3	.20	34	N.E.	101	51	50	75.1	.04	34	N.E.
February	101	49	52	73.4	—	29	”	103	50	53	75.8	—	26	”
March	109	55	54	84.0	.45	34	”	105	57	48	82.9	.12	40	”
April	109	66	43	89.0	1.05	45	N.E. & S.W.	104	63	41	84.2	2.23	54	S.W.
May	107	62	45	84.8	4.66	59	S.W.	103	63	40	79.6	4.55	69	W. & S.W.
June	96	66	30	81.4	5.39	64	”	92	62	30	77.6	5.18	80	S.W.
July	95	66	29	79.5	10.32	72	”	91	64	27	76.5	10.91	79	”
August	91	65	26	77.6	9.31	75	”	90	64	26	75.8	11.52	81	”
September	95	62	33	80.6	7.55	70	”	93	65	28	78.5	8.13	74	S.W. & S.
October	100	58	42	80.4	1.07	50	”	99	56	43	78.9	.77	65	S.W.
November	100	48	52	75.8	—	32	E.	101	48	53	75.3	—	42	N.E.
December	95	43	52	70.5	—	34	N.E.	97	48	49	71.0	—	31	”
Year	109	43	66	79.2	40.00	50	S.W.	105	48	57	77.5	43.35	56	S.W.

MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade Max.	Shade Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade Max.	Shade Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January	97	60	37	80.5	.30	77	S.W.	99	57	42	78.3	—	31	E. & N.E.
February	101	—	—	83.6	—	57	“	101	60	41	82.0	—	28	E.
March	100	—	—	—	3.53	67	“	102	62	40	85.2	.95	51	“
April	100	68	32	83.6	6.69	69	“	102	65	37	84.1	3.40	66	“
May	95	67	28	80.4	10.46	84	“	100	67	33	81.0	4.83	72	“
June	100	65	35	78.8	7.79	84	“	95	64	31	79.2	10.30	77	W.
July	88	68	20	77.5	4.31	81	“	93	66	27	78.1	4.30	81	“
August	93	65	28	77.1	.50	81	“	88	66	22	76.3	10.40	82	“
September	101	66	35	79.0	8.83	80	“	92	63	29	78.2	16.64	77	“
October	103	67	36	80.6	8.38	81	“	96	62	34	79.6	2.70	71	“
November	98	62	36	81.0	1.98	74	“	99	49	50	78.3	.18	46	“
December	105	57	48	78.1	.71	60	N. & S.W.	97	46	51	76.6	.39	33	N.E.
Year	105	57	48	79.6	52.58	75	S.W.	102	46	56	79.7	54.09	60	W. & E.

METEOROLOGICAL RETURN FOR THE YEAR 1911—*continued.*

YOLA.

BANCHI.

MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade Max.	Shade Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade Max.	Shade Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January ...	99	65	34	82.1	—	56	N.E.	97	54	43	77.9	—	29	N.
February ...	101	69	32	84.0	—	50	“	100	57	43	77.5	—	24	N.E.
March ...	105	67	38	88.2	—	51	N.W.	103	62	41	84.5	—	34	N.W. to N.
April ...	104	69	35	87.1	3.89	67	“	104	68	36	86.4	1.61	48	N.E.
May ...	99	67	32	82.5	6.96	76	“	102	65	37	80.0	9.01	66	S.W.
June ...	95	67	28	80.7	4.17	75	“	92	62	30	78.4	8.16	68	S.W. & S.E.
July ...	91	65	26	79.7	5.21	75	“	92	63	29	76.4	7.39	78	S.W.
August ...	91	69	22	78.4	11.94	81	“	88	64	24	74.9	13.74	80	“
September ...	92	69	23	78.9	6.95	77	“	90	65	25	77.6	7.26	71	“
October ...	97	69	28	81.4	2.89	70	“	95	65	30	79.5	1.12	59	N.E. & S.W.
November ...	97	59	38	80.8	—	51	“	96	58	38	77.6	—	35	N.E.
December ...	96	62	34	79.1	—	42	“	92	55	37	73.6	—	38	“
Year ...	105	59	46	81.9	42.22	64	N.W.	104	54	50	78.6	48.79	53	S.W.

SOKOTO.

GEIDAM.

MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade Max.	Shade Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade Max.	Shade Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January ...	94	51	43	74.7	—	28	N.E.	107	49	58	77.3	—	30	N.E.
February ...	98	60	38	78.0	—	25	“	104	47	57	76.5	—	24	“
March ...	106	61	45	86.7	—	33	S.W.	119	54	65	85.0	—	27	“
April ...	107	73	34	90.9	—	39	“	118	58	60	90.9	—	31	“
May ...	105	73	32	87.4	2.51	55	“	115	64	51	89.6	—	42	S.W. & W.
June ...	99	68	31	83.4	6.02	62	“	112	69	43	90.1	1.09	47	S.W.
July ...	97	69	28	80.4	4.86	70	“	105	64	41	87.2	1.85	59	“
August ...	89	68	21	77.7	7.81	75	“	101	66	35	81.7	6.31	70	W.
September ...	91	67	24	79.7	6.83	71	“	108	68	40	85.4	—	66	“
October ...	95	67	28	81.0	—	59	“	106	62	44	85.8	—	39	W. & N.E.
November ...	95	61	34	79.3	—	33	N.E.	103	53	50	79.1	—	25	N.E.
December ...	92	53	39	72.8	—	34	“	101	49	52	73.6	—	33	“
Year ...	107	51	56	81.0	28.70	49	S.W.	119	47	72	83.6	10.46	41	N.E.

METEOROLOGICAL RETURN FOR THE YEAR 1911—*continued.*

MAIDUGURI.

KATAGUM.

MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.		
	Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.			
January ...	101	52	49	77.7	—	37	N.E.	94	51	43	73.6	—	0.5	40	N.E.	
February ...	104	54	50	75.8	—	30	„	103	48	55	74.9	—	32	„	„	
March ...	110	58	52	85.9	—	26	E.	111	55	56	86.4	—	34	„	„	
April ...	111	67	44	91.6	—	32	S.W.	113	64	49	90.8	—	21	47	W.	
May ...	111	72	39	90.4	—	72	46	„	109	65	44	88.4	—	48	54	S.W.
June ...	103	67	36	86.5	3.55	54	„	107	70	37	87.3	—	21	62	W. & S.W.	
July ...	101	67	34	83.4	9.29	68	„	98	68	30	82.6	—	77	69	„	
August ...	93	67	26	7.9	12.72	80	„	95	66	29	79.5	—	69	77	„	
September ...	97	67	30	82.1	2.83	74	„	102	69	33	83.1	—	79	70	S.W.	
October ...	103	62	41	83.2	—	57	53	„	102	62	40	83.4	—	83	50	N.E.
November ...	99	54	45	77.2	—	30	N.E.	100	51	49	77.6	—	28	„	„	
December ...	99	51	48	72.8	—	33	E.	98	48	50	72.4	—	35	„	„	
Year ...	111	51	60	82.1	30.00	47	S.W.	113	48	65	81.7	—	19.96	50	N.E. & S.W.	

BARO.

NAFADA.

MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.	
	Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		
January ...	100	65	35	83.7	—	62	S.W. & N.W.	100	—	—	76.6	—	—	41	N.E. & W.
February ...	105	70	35	87.9	—	51	S.W.	105	52	53	85.8	—	16	30	N.E.
March ...	106	72	34	88.8	—	27	60	109	52	57	89.4	—	44	38	„
April ...	106	68	38	87.8	2.81	68	„	109	66	43	85.7	—	47	44	„
May ...	101	67	34	83.1	11.00	75	„	106	66	40	85.7	—	55	66	„
June ...	99	68	31	82.6	4.30	75	„	101	66	35	82.7	—	34	69	W. & S.W.
July ...	99	68	31	82.1	5.75	84	„	95	66	29	81.1	—	84	71	W.
August ...	98	70	28	80.0	4.35	82	„	92	65	27	76.2	—	903	79	„
September ...	99	68	31	82.2	10.85	79	„	97	66	51	89.6	—	400	72	„
October ...	100	50	50	82.7	6.61	75	„	100	57	43	80.6	—	96	69	„
November ...	100	67	33	84.6	—	20	68	101	45	56	75.5	—	40	40	E.
December ...	99	64	35	81.1	—	60	„	99	47	52	73.2	—	31	31	N.E.
Year ...	106	50	56	83.8	46.14	70	S.W.	109	45	64	—	30.32	54.5	W. & N.E.	

METEOROLOGICAL RETURN FOR THE YEAR 1911—*continued.*

BIRNIN KEBBI.

IBO.

MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January ...	99	52	47	75.6	—	34	N.E.	97	65	32	81.0	77	70	S.W.
February ...	104	55	49	78.2	—	28	“	104	63	41	81.7	—	45	N.E.
March ...	109	56	53	86.5	.08	38	N.E. & E.	105	66	39	87.5	2.12	67	S.W.
April ...	109	70	39	89.5	.60	50	S.W. & W.	103	70	33	85.7	4.67	78	“
May ...	108	68	40	85.7	3.79	60	S.W.	94	68	26	81.0	6.18	78	“
June ...	102	68	34	84.3	2.73	67	“	93	68	25	80.0	4.02	83	“
July ...	96	66	30	82.3	8.00	77	“	92	68	24	80.0	3.15	83	“
August ...	94	67	27	80.1	8.93	82	“	96	68	28	79.5	1.75	82	“
September ...	100	68	32	82.0	5.89	72	“	92	68	24	80.2	7.08	83	“
October ...	98	64	34	82.0	.67	58	“	95	69	26	81.2	6.63	82	“
November ...	99	54	45	78.9	—	37	N.E.	95	62	33	81.8	—	75	“
December ...	97	51	46	73.0	—	32	“	98	60	38	80.0	.01	51	N.E.
Year ...	109	51	58	81.5	30.69	53	S.W.	105	60	45	81.8	36.38	73	S.W.

NARAGUTA.

KEFFI.

MONTH.	TEMPERATURE.				RAINFALL.		WIND.	TEMPERATURE.				RAINFALL.		WIND.
	Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.		Shade, Max.	Shade, Min.	Range.	Mean.	Amount in inches.	Degree of Humidity.	
January ...	95	51	44	71.6	—	25	N.E.	104	57	47	79.2	—	54	N.E.
February ...	96	54	42	77.4	.24	41	E.	101	63	48	78.9	—	40	“
March ...	97	61	36	77.2	—	51	W. & S.W.	102	64	38	83.7	1.10	63	S.W.
April ...	90	60	30	74.0	10.09	65	S.W.	101	68	33	83.0	1.58	73	“
May ...	88	61	27	73.2	7.88	66	“	96	67	29	79.7	3.40	81	“
June ...	85	60	25	71.3	11.44	68	“	92	67	25	78.8	5.58	86	“
July ...	83	59	24	69.1	16.09	77	“	89	66	23	76.7	10.33	89	“
August ...	88	60	28	73.0	8.84	64	S.E. & E.	89	67	22	77.0	6.68	89	“
September ...	89	57	32	73.4	3.26	51	N.E.	90	61	29	81.3	7.80	89	“
October ...	90	54	36	72.8	—	27	N.E. & E.	95	Insufficient record.	—	—	3.16	86	S.E.
November ...	88	52	36	70.2	—	32	“	96				.82	74	N.E.
December ...	—	—	—	—	—	—	—	97				—	64	“
Year ...	97	51	46	73.0	57.84	51	S.W.	104	—	—	—	40.45	74	S.W.

TABLE V.

ZUNGERU AND LOKOJA HOSPITALS.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1911.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1911—*continued.*

DISEASES.	ZUNGERU.										LOKOJA.											
	EUROPEANS.					NATIVES.					EUROPEANS.					NATIVES.						
	Remained end of 1910.	Admissions.	Deaths.	Total Cases Treated.	Remaining end of 1911.	Remained end of 1910.	Admissions.	Deaths.	Total Cases Treated.	Remaining end of 1911.	Remained end of 1910.	Admissions.	Deaths.	Total Cases Treated.	Remaining end of 1911.	Remained end of 1910.	Admissions.	Deaths.	Total Cases Treated.	Remaining end of 1911.		
Brought forward	24			24	1	7	507	12	514	9	1	63	1	1	64	1	27	576	1	30	603	16
DISEASES OF THE NERVOUS SYSTEM:—																						
Degeneration of Spinal Cord																						
Paralysis																						
Epilepsy																						
Vertigo																						
Headache																						
Neuralgia																						
Sciatica																						
Hysteria																						
Meningitis																						
Mania																						
Melancholia																						
Mental Stupor																						
Neurasthenia																						
DISEASES OF THE EYE:—																						
Conjunctivitis																						
Ulcer of Cornea																						
Blepharitis Marginalis																						
DISEASES OF THE EAR:—																						
Inflammation of Middle Ear																						
Inflammation of Internal Ear																						
DISEASES OF THE NOSE:—																						
Polypus																						
DISEASES OF THE CIRCULATORY SYSTEM:—																						
Pericarditis																						
Valve Disease of Heart																						
Disord. action of Heart																						
Phlebitis																						
Syncope																						
DISEASES OF THE RESPIRATORY SYSTEM:—																						
Asthma																						
Laryngitis																						
Bronchitis																						
Bronchiectasis																						
Phthisis																						
Pleurisy																						
Empyema																						
DISEASES OF THE DIGESTIVE SYSTEM:—																						
Alveolar Abscess	1			1		1																
Tonsilitis	3			3		3																
Dental Caries																						
Pharyngitis	4			4		1																
Gastritis																						
Indigestion																						
Enteritis	5			5		1																
Appendicitis	1			1		2																
Colitis	3		1	3																		
Hernia																						
Intestinal Obstruction																						
Sore Throat																						
Diarrhoea																						
Constipation																						
Colic																						
Fistula in Ano																						
Piles																						
Prolapse of Rectum																						
Hepatitis																						
Carried forward	42	1	42	2	8	685	15	702	10	1	87	1	88	1	30	772	45	792	19			

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1911—*continued.*

DISEASES.	ZUNGERU.								LOKOJA.											
	EUROPEANS.				NATIVES.				EUROPEANS.				NATIVES.							
	Remained end of 1910.	Admissions.	YEARLY TOTAL.	Deaths.	Remained end of 1911.	Total Cases Treated.	Remained end of 1910.	Admissions.	YEARLY TOTAL.	Deaths.	Remained end of 1911.	Total Cases Treated.	Remained end of 1910.	Admissions.	YEARLY TOTAL.	Deaths.				
Brought forward	42	1	42	2	8	685	15	702	10	1	87	1	88	1	30	772	45	792	19
DISEASES OF THE DIGESTIVE SYSTEM:— —continued.																				
Jaundice	1	...	1	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...
Congestion of Liver
Peritonitis
Ascites
DISEASES OF THE LYMPHATIC SYSTEM:—																				
Splenitis	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Inflammation of Glands	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bubo	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lymphangitis
Lymphadenitis
DISEASES OF THE GENITO-URINARY SYSTEM:—																				
Cystitis
Hæmaturia
Phimosis
Ulcer of Penis
Œdema of Penis
Soft Chancre
Hydrocele
Orchitis
Stricture of Urethra
Abortion
DISEASES OF THE ORGANS OF LOCOMOTION:—																				
Periostitis	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Synovitis
Myalgia
DISEASES OF THE CONNECTIVE TISSUE:—																				
Inflammation	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Abscess
DISEASES OF THE SKIN:—																				
Urticaria
Eczema	6	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Boil
Ainhum
Herpes
Dermatitis
Psoriasis
Impetigo
Ulcer
Ringworm
CIRCUMCISIONS	54	1	54	2	9	811	16	820	18	1	108	2	109	1	35	883	46	918	25
Total	54	1	54	2	9	811	16	820	18	1	108	2	109	1	35	883	46	918	25

BARO EUROPEAN HOSPITAL.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE
YEAR 1911.

Diseases.	Remained at end of 1910.	Yearly Total.		Total cases treated.	Remaining at end of 1911.
		Admissions.	Deaths.		
Blackwater Fever ... ... ... ...	...	1	...	1	...
Dysentery	1	1	...	2	...
Erysipelas ... ... ... ...	...	1	1	1	...
Malaria ... ... ... ...	...	31	...	31	...
Pyrexia of uncertain origin...	...	1	...	1	...
Small Pox ... ... ... ...	...	1	...	1	...
Anæmia ... ... ... ...	...	3	...	3	...
EFFECTS OF INJURIES ... ... ... ...	...	6	...	6	...
Dislocation ... ... ... ...	...	1	...	1	...
DISEASES OF THE NERVOUS SYSTEM: —					
Epilepsy ... ... ... ...	...	1	...	1	...
Neurasthenia ... ... ... ...	...	1	...	1	...
DISEASES OF THE EYE: —					
Conjunctivitis ... ... ... ...	...	1	...	1	...
DISEASES OF THE RESPIRATORY SYSTEM: —					
Pleurisy ... ... ... ...	...	2	...	2	...
DISEASES OF THE DIGESTIVE SYSTEM: —					
Tonsilitis ... ... ... ...	...	2	...	2	...
Gastritis ... ... ... ...	...	3	...	3	...
Enteritis ... ... ... ...	...	1	...	1	...
Colitis ... ... ... ...	...	1	...	1	...
Diarrhoea ... ... ... ...	...	1	...	1	...
Hepatitis ... ... ... ...	...	1	...	1	...
Jaundice ... ... ... ...	...	1	...	1	...
DISEASES OF THE LYMPHATIC SYSTEM: —					
Lymphadenitis ... ... ... ...	...	2	...	2	...
Lymphangitis ... ... ... ...	...	1	...	1	...
DISEASES OF THE GENITO-URINARY SYSTEM: —					
Albuminuria ... ... ... ...	...	1	...	1	...
Abortion ... ... ... ...	...	1	...	1	...
DISEASES OF THE ORGANS OF LOCOMOTION: —					
Periostitis ... ... ... ...	...	1	...	1	...
Myalgia ... ... ... ...	...	2	...	2	...
DISEASES OF THE CONNECTIVE TISSUE: —					
Inflammation ... ... ... ...	...	4	...	4	...
DISEASES OF THE SKIN: —					
Herpes Zoster ... ... ... ...	...	1	...	1	...
Totals ...	1	74	1	75	...

ZUNGERU PRISON HOSPITAL.

RETURN OF DISEASES AND DEATHS (NATIVE IN-PATIENTS)
FOR THE YEAR 1911.

Diseases.	Remained at end of 1910.	Yearly total.		Total cases treated.	Remaining at end of 1911.
		Admissions.	Deaths.		
Beri-Beri	7	...	1	7	...
Dysentery	6	46	2	52	5
Gonorrhœa ... ... ... ... ...	...	1	...	1	...
Malaria	4	45	1	49	...
Osteo-Myelitis	1	1	...	2	...
Pneumonia	1	7	6	8	1
Pyrexia of uncertain origin ...	...	21	...	21	...
Rheumatic Fever	2	9	...	11	1
Syphilis ... ... ... ...	...	1	1	1	...
Tuberculosis ... ... ... ...	...	1	...	1	...
Anæmia	1	23	...	24	1
Effects of Parasites	1	22	...	23	1
" " Injuries ... ... ...	...	9	...	9	1
" " Poisons ... ... ...	...	1	...	1	...
Diseases of the Nervous System ...	...	1	...	1	...
" " Eye ... ...	...	1	...	1	...
" " Circulatory System ...	...	2	1	2	...
" " Respiratory System ...	4	23	5	27	1
" " Digestive System ...	...	43	...	43	1
" " Lymphatic System ...	...	5	...	5	...
" " Genito-Urinary ...	...	9	...	9	...
" " Organs of Locomotion ...	...	20	...	20	...
" " Connective Tissue ...	...	11	...	11	...
" " Skin	1	7	...	8	...
Totals	28	309	17	337	12

TABLE VI.

RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1911.

FROM RETURNS RECEIVED FROM OUT-STATIONS, PATROLS, ETC.

DISEASES.	Remaining in Hospital at end of 1910.	EUROPEANS.				NATIVES.					
		YEARLY TOTAL.		Total Cases Treated.	Remaining in Hospital at end of 1911.	YEARLY TOTAL.		Total Cases Treated.	Remaining in Hospital at end of 1911.		
		Admissions.	Deaths.			Admissions.	Deaths.				
Blackwater Fever	...	5	3	5	...	...	...	...	...
Beri-Beri	7	3	1	10	...	...
Cerebro-spinal Fever	1	1	1	1	...	...
Chicken Pox	10	...	...	10	...	2		
Cow Pox	17	...	...	17	...	...
Diphtheria	1	1	1	1	...	...
Dysentery	...	16	17	346	14	354	6	...	...
Enteric Fever	1	...	1	1	...	...
Enteritis, Infective	3	...	3	3	...	...
Erysipelas	...	1	1	2	1	1	2	2	...		
Gonorrhœa	...	1	1	25	1,170	...	1,195	29	...		
Influenza	39	6	39	...	...	...
Leprosy	83	...	84	61	...	...
Malaria	...	126	126	1,233	9	1,245	8	...	...
Measles	3	...	3	3	...	...
Osteo-Myelitis	1	3	...	4	...	...
Pneumonia	86	25	90	2	...	...
Pyæmia	3	3	3	3	...	...
Pyrexia of uncertain origin	...	17	17	190	1	190	...	...	...
Relapsing Fever	3	...	3	3	...	...
Rheumatic Fever	...	1	4	362	2	371	5	...	...
Septicæmia	8	3	8	8	...	...
Sleeping Sickness	24	2	27	7	...	...
Small Pox	55	12	55	...	...	...
Syphilis	415	6	465	65	...	...
Tetanus	1	1	1	1	...	...
Tuberculosis	...	1	1	22	9	22	1	...	...
Whooping-cough	16	...	18	...	...	...
Yaws	122	1	131	6	...	...
Anæmia	...	9	9	159	4	160	1	...	...
Debility	...	11	11	59	4	62	...	...	...
New growths	22	1	22	...	...	...
Effects of Parasites	...	4	4	1,516	3	1,548	10	...	...
Effects of Injuries	1	45	46	5,298	19	5,403	100	...	...
Sunstroke	...	5	5	...	...	...	...	...	...
Heatstroke	...	3	3	...	...	...	...	...	...
Burns	...	4	4	...	...	...	...	...	...
Strains	...	14	14	...	...	...	...	...	...
Fractures	...	2	2	...	...	...	...	...	...
Dog bites	...	3	3	...	...	...	...	...	...
Effects of foreign bodies	...	1	1	21	...	21	...	...	...
Effects of Poisons	78	1	79	...	...	...
Ptomaines	...	2	2	...	...	...	...	...	...
Insect stings	...	4	4	...	...	...	...	...	...
Carried forward	...	4	278	3	282	4	273	11,376	130	11,648	303

RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1911—*continued.*

DISEASES.	EUROPEANS.					NATIVES.				
	Remaining in Hospital at end of 1910.	YEARLY TOTAL.		Deaths.	Total Cases Treated.	Remaining in Hospital at end of 1911.	YEARLY TOTAL.		Deaths.	Total Cases Treated.
		Admissions.					Admissions.			
Brought forward	4	278		3	282	4	273	11,376	130	11,648
Diseases of the Nervous System								264	9	267
Hemiplegia	2									
Torticollis	1									
Neuralgia	7									
Sciatica	6									
Neurasthenia	4									
Melancholia	1									
Insomnia	1									
Diseases of the Eye								818		820
Conjunctivitis	10									
Ulcer of Cornea	1									
Blepharitis	1									
Chalazion	1									
Diseases of the Ear								153		155
Inflammation Ext. Meatus	8									
Impacted Cerumen	2									
Inflammation Middle Ear	3									
Diseases of the Nose								5		5
Rhinitis	5									
Inflammation Naso-Pharynx	2									
Diseases of the Circulatory System								73		75
Valvular disease of Heart	3									
Arterial Sclerosis	1									
Diseases of the Respiratory System								19	11	1,453
Asthma	3									
Laryngitis	4									
Bronchitis	21									
Phthisis	1									
Diseases of the Digestive System								1,434	11	19
Stomatitis	1									
Inflammation Dent. peri-osteum		1								
Gumboil	3									
Caries		18								
Toothache	4									
Sore Throat	3									
Tonsilitis	7									
Pharyngitis	6									
Gastritis	1	28								
Indigestion		30								
Enteritis		19								
Colitis		5								
Hernia		1								
Diarrhoea		25								
Constipation		7								
Colic		2								
Ischio-rectal abscess	1									
Piles	7									
Hepatitis	2									
Congestion of Liver		4								
Carried forward	7	539		3	548	5	313	17,051	190	17,363
										347
										Remaining in Hospital at end of 1911.

RETURN OF DISEASES (OUT-PATIENTS) FOR THE YEAR 1911—*continued.*

DISEASES.	EUROPEANS.						NATIVES.					
	Remaining in Hospital at end of 1910.	YEARLY T. TAL.		Total Cases Treated.	Remaining in Hospital at end of 1911.	Remaining in Hospital at end of 1910.	YEARLY TOTAL.		Total Cases Treated.	Remaining in Hospital at end of 1911.		
		Admissions.	Deaths.				Admissions.	Deaths.				
Brought forward ...	7	539	7	548	5	313	17,051	190	17,363	347		
Diseases of the Lymphatic System	7	...	...	2	179	1	181	4			
Lymphadenitis	6	...	6	2	...	...	...	...	...
Lymphangitis		
Diseases of the Genito-Urinary System	7	265	5	272	7			
Renal Calculus	2	...	2	...	...	...	...	...	...
Cystitis	2	...	2	1	...	...	...	...	...
Phosphaturia	1	...	1	...	...	...	...	...	...
Stricture of Urethra	1	...	1	...	...	...	...	...	...
Urethral fistula	1	...	1	1	...	...	...	...	...
Inflammation of Prostate	4	...	4	...	...	...	...	...	...
Balanitis	1	...	1	...	...	...	...	...	...
Orchitis	1	...	1	...	...	...	...	...	...
Diseases of the Organs of Locomotion	15	1,214	1	1,229	13			
Periostitis	2	...	2	...	...	...	...	...	...
Arthritis	1	...	1	...	...	...	...	...	...
Synovitis	7	...	7	...	...	...	...	...	...
Myositis	1	...	1	...	...	...	...	...	...
Myalgia	9	...	9	...	...	...	...	...	...
Stiff neck	1	...	1	...	...	...	...	...	...
Lumbago	3	...	3	...	...	...	...	...	...
Diseases of Connective Tissue	22	752	1	774	14			
Inflammation	1	9	10	...	...	...	...	...	...
Abscess	8	...	8	...	...	...	...	...	...
Diseases of the Skin	86	2,034	...	2,120	81			
Urticaria	2	...	2	...	...	...	...	...	...
Eczema	7	...	7	...	...	...	...	...	...
Impetigo	2	...	2	...	...	...	...	...	...
Boil	24	...	24	...	...	...	...	...	...
Carbuncle	1	...	1	...	...	...	...	...	...
Dermatitis	6	...	6	...	...	...	...	...	...
Corn	3	...	3	...	...	...	...	...	...
Ringworm	1	4	5	...	...	...	...	...	...
Prickly Heat	8	...	8	...	...	...	...	...	...
Alopecia	2	...	2	...	...	...	...	...	...
Onychia	4	...	4	...	...	...	...	...	...
Whitlow	1	2	3	...	...	...	...	...	...
Ulcers	1	4	5	...	1	1	1	...	...
Undefined		
Totals ...	11	675	3	686	9	445	21,495	199	21,940	466		

SANITATION.

(A.) GENERAL REVIEW OF WORK DONE, LAWS PASSED AND PROGRESS MADE.

(I.)—ADMINISTRATIVE.

Early in April, my colleague, Dr. Foy, returned to the Protectorate from leave in England and took up the duties of his new office of Sanitary Officer.

The tours of inspection made during the year covered a large portion of the Protectorate; and there remains only a comparatively small area through which such tours have not been made. Remembering, however, that the area of the Protectorate is considerably greater than twice that of the British Isles, and that transport is slow and often difficult, it will be understood that tours of inspection must be, in great part, superficial rather than intimate. What is aimed at is to make careful inspections of typical places, such as the headquarters of the various Emirs and those of District Headmen, to lay down principles freely illustrated by examples found on the spot, and to secure gradual reform through the agency of the Native Administration.

The regions traversed were the southern provinces of Ilorin, Kabba, and Bassa; the large province of Bornu; Zaria; Bauchi, including the emirates of Bauchi, Gombe, and Nafada; Kano, including the emirates of Kano, Katsina, and Katagum; Kontagora, including Sakaba and the emirate of Kontagora; the emirate of Gando; and the whole course of the Baro-Kano Railway, including the various places along the line.

The greater part of the year's work was carried through by Dr. Foy, the Sanitary Officer, the Senior Sanitary Officer having been absent on leave for well nigh half the year.

In Bornu, careful inspections were made of the stations of Maidugari, Gujba, and Geidam, together with the headquarter towns of various District Headmen. The tour through Bornu was a very satisfactory one: the Shehu or Sultan of Bornu, his District Headmen, and the Sarikin Bedde of Gorgoram are in the habit of taking very seriously anything which the Resident tells them; and, previously instructed by him that sanitary matters constituted an affair of serious moment, they paid admirably serious attention to the representations made to them.

Bornu is a most interesting Mohammedan State, possessing a long history and ancient civilization. The early days of the present century found it in a state of anarchy from which it only began to emerge when the Government took effective occupation of it in 1902 and restored the native dynasty, which had been driven out by the Sudanese invader, Rabeh; but the ancient system of administration has not been forgotten by the older men, enough of whom remain to instruct the present generation; although venal and false, they are shrewd and intelligent, and there is no difficulty in making them comprehend elementary sanitary principles. Many of their customs are of great assistance to sanitary activity: for example, they prefer to have their markets outside of their towns; they are fond of open spaces and wide thoroughfares; and they generally dig their wells—many of them very deep, and some of them going down 50 fathoms—at a considerable distance from human habitations.

The country is a comparatively waterless one—rainfall for the year at Geidam, 10·48 inches—and the range of temperature is great: the highest shade temperature and the greatest range of temperature—119° and 70° respectively—having also been reported from Geidam. During the dry season, when water is only to be found in deep wells and in holes scooped out of the dry beds of the few watercourses, mosquitoes are not common; and, with the exception of the neighbourhood of Lake Tchad and the district along the river Yo or Wobe, malarial affections are decidedly less common than they are in most other parts of the Protectorate.

Like the other Mohammedan Provinces, Bornu possesses its pagan fringe; the denizens of which exist in the same isolated parochial communities as is the case elsewhere. With the exception of this peripheral pagan region, the country is a cattle country, and the plague of flies is universal, except in those parts of the uninhabited bush, where domestic live-stock are not found.

Despite the spare rainfall, the soil is exceedingly fertile; and an annually increasing set of new areas is being brought under cultivation. A natural granary, Bornu is probably the nearest approach to a white man's country to be found in this Protectorate.

Fine broad roads traverse the Province along all the customary routes, and fine rest-camps have been constructed at convenient distances along all of them; the only fault to be found with the rest camps being that, in some cases, they are too near to the native towns.

The natives have lost the art of making burnt bricks, an art which was formerly practised in the north; good earth for the construction of houses of sun-dried mud is not common; white ants reign supreme; and the ruck of the people occupy ramshackle grass hovels which require continual renewal.

For latrine purposes, the tumburi—called salga by the Hausas—which is indigenous, is tending to come into universal use. A tumburi is an elementary septic pit: it is a hole about eight feet deep, having a small orifice at the surface, but expanding largely below; it is customary to keep the orifice closed with a native pot, and occasionally to build a grass hut over it; the contents are fluid and do not smell offensively, and the fluid percolates through the surrounding earth so that the salga does not require to be cleaned out; and, where the wells are remote as is generally the case in Bornu, it is difficult to find a better device than the salga for general use.

At Maidugari, the headquarter station of the Province, the European civilians inhabit permanent houses, and similar housing for military Europeans is in contemplation. Here also the Shehu or Sultan of Bornu has had constructed for himself, in the native town over a mile away, a two-storied house of burnt brick with verandahs and an iron roof, he being the only native potentate in the Protectorate who possesses such a residence.

At Geidam and at Gujba, the Europeans are housed in unfurnished native-built mud houses; but the erection of permanent buildings at both of those stations is part of the building scheme for 1912.

The Medical Officers stationed in Bornu—at Maidugari and at Geidam—have always been keen on sanitary work, and, by the help so heartily extended to them by the Resident and his political colleagues, have been able to effect much good by instructing the people in their districts and by inducing them to remove some of the more glaring sanitary abuses.

Much good work is being done at Maidugari and at Geidam in the native hospitals, which are supported at those places by the natives themselves. Those two native hospitals are distinct from the station native hospitals for

soldiers and employees. The people speak of them as the Shehu's hospitals; and women and children are treated therein who would never come near the station native hospitals.

KANO.

In the Province of Kano, the emirates of Katagum, Kano, and Katsina received attention in the course of a tour.

KATAGUM.

This emirate marches with the country of the Sarikin Bedde of Gorgoram—who rules over the Bedde people, a Kanuri-speaking race which does not recognise the authority of the Sultan of Bornu—which is bounded by Bornu proper on the east and by the emirate of Katagum on the west.

On the way from Gorgoram to the town of Katagum—the headquarters of the emirate—the Kanuri language spoken in Bornu gradually becomes replaced by Hausa, and, thus, on emerging from the boundary of the Province of Bornu, one leaves behind the only Mohammedan region in the Protectorate where the Hausa language cannot be regarded as a *lingua franca*.

Katagum is situated on the left bank of the river Yo or Wobe, and the native town is up-stream from the European station, but to leeward of it, and a good half-mile distant.

The station does not impress one favourably; it is overgrown with grass and shrubs, and the vegetation remains green through the greater part of the dry season. At high water the river overflows nearly the entire region. Much water lies between the European quarter and the fort on the one hand, and the soldiers' lines on the other. The river also overflows the ditches around the native town, and touches the town wall itself. Communication with the surrounding country is very difficult, and much of it has to be effected by canoe.

The subsoil water is never far from the surface, and anybody can see that the whole place must be a flooded marsh in the rains.

The European compounds are too small; the houses are built of mud, and the floors are constructed of beaten mud. Holes in the wall supply the places of doors and windows; they have flat mud roofs which are thatched over, and all have thatched verandahs, with the exception of the one occupied by the European N.C.O.

Flies are a chronic pest, so also are the white ants, which always keep the mud houses squalid. Mosquitoes are not unbearably numerous at the height of the dry weather, but are a very serious nuisance during the greater part of the year.

The water supply, which is fair, is obtained from the river both for the station and for the native town.

The native town is by no means a pattern one, and compares unfavourably with many Hausa towns of less importance.

Cases of Sleeping Sickness have been reported in the immediate neighbourhood, within the last six years, but none has been diagnosed by a Medical Officer, or supported by reliable European testimony. The Emir and his Sarakuna, however, know the disease well by reputation. It is suggestive that the people do not breed cattle, but import them from a distance.

The site is a most undesirable one for an European station, or even for a native town. It can never be made a good one, and the continual retention of it for an European station can only be justified on paramount political or military grounds.

The question of evacuating Katagum is under consideration. An admirable site was inspected at a place called Gadia, 26 miles to the south; but the most recent reports have, unfortunately, thrown some doubt upon the quantity of water available there.

The road from Gadia to Kano is not used by Europeans, they using the main road from Katagum to Kano, but along its course through both emirates are many prosperous native towns. It is much frequented by native traders with their pack animals; and, although they have not been specially directed to do so, the local Headmen have, with the exception of a few miles, constructed a fine broad road, often fenced or hedged, all the way, on the model of the roads constructed under European direction. Most of the towns are fair examples of the average well-managed Hausa town. The leading men are intelligent and friendly, the peasantry appear to be industrious and fairly well off, and the region is altogether a tempting one to the sanitary reformer.

KANO.

The emirate of Kano, although its capital city of the same name and its other considerable towns are hives of brisk trade and busy industry, is emphatically an agricultural country. Practically its entire arable area is characterized by the most laboriously intensive cultivation, nothing which to the knowledge of the inhabitants will add to or maintain the fertility of the soil is allowed to go to waste. Everything in the towns and villages, in the way of ordure and waste material which can be used as manure is industriously collected, carried away, and applied to the land, and the result is very satisfactory from the sanitary point of view. Among the better classes the use of salgas is fairly general, and although they undoubtedly often lead to the contamination of wells, they certainly result in the towns being superficially sweeter than would be the case otherwise. As is the case throughout the Protectorate, there is much fouling of the ground, but the daily collection of refuse for manure, already mentioned, greatly mitigates this.

During the year, the sanitary activities of the District Headmen were greatly quickened by the action of the Emir, and it is possible to detect the germ of a wholesome feeling that an insanitary town is something to be ashamed of.

The application of parapets to the mouths of wells is becoming steadily more fashionable; new wells are being dug outside of the towns, and away from sources of contamination, in increasing numbers; and the objectionable custom of permitting cattle and other live-stock to collect round the mouths of the wells tends to become less common.

Live-stock being plentiful in most places, flies are a perpetual nuisance; and, in the towns, the numerous mosquitoes afford evidence of the presence of much uncovered water within the compounds.

Every trade route throughout the emirate being a busy one, and numerous nocturnal camping places for traders, who are not very nice in their habits as a rule, being the result, it is not surprising that numerous insanitary foci—practically beyond the control of the local inhabitants—are to be found everywhere.

A native may be very careful of his home surroundings, and yet never think of taking any sanitary precautions in camp; but the native can hardly be

blamed for this peculiarity, a peculiarity which he shares with plenty of Occidental Europeans, who have enjoyed more sanitary lessons than are likely to be conveyed to the native for the next century at least.

The town of Kano itself is probably the least insanitary large town in the Protectorate. It will be long ere its numerous borrow pits—many of them ponds—the work of centuries, are filled in; but it would be difficult to imagine a town, all the buildings and walls of which were of mud, and where there were no concreted or paved or macadamized thoroughfares or areas, where surface cleansing could be more effectively carried out than it is in Kano now. The city is really an Oriental one, and it shines by contrast with many towns, possessing greater advantages both artificial and natural, in the much more highly civilized East.

The inhabited portion of the city only occupies a portion of the area enclosed by the wall, the remainder of the area being given over to farming.

The market is extensive and well laid out in orderly streets of substantially built mud booths; it is the finest market in the Protectorate, and it is probably the only one of the many really fine institutions of the city which owes its origin to European prompting entirely. The Emir, in the course of the year, caused a greatly needed addition to be made to the market in the shape of sufficient latrine accommodation for the people frequenting it; and, now, the fact that those people have to obey the calls of nature is no longer apparent to the senses.

A fine new native prison has been completed, but it requires to be fitted with cement floors before it can be entirely satisfactory. In designing this new prison, the Emir received assistance from the Resident.

The slaughtering ground is on an open uninhabited area, well removed from the market. The slaughtering of animals is carried out in the early morning; everything which is of use is at once removed, and such filth as cannot be applied to the farms as manure is at once buried; and the wonderfully small number of flies over the area, and the absence of carrion birds after the early morning, afford abundant proof of the efficacy of the cleansing methods practised.

Lime and stone fit for use in building are both found around the city; but the people do not understand the arts of burning lime and of making burnt bricks. This will probably be altered before long, with the result that buildings will be greatly improved and much labour will be saved. As things are at present, the mud walls and buildings call for a continuous course of tinkering, the cost of which would be prohibitive were labour not so cheap; labour can be obtained at threepence per diem, when Europeans are not competing for it.

The most important reform called for in Kano is the arranging of a water supply from outside of the wall and the closing of the intra-mural wells, so that the existing system of salgas may be maintained and the contamination of water by them ended. It will be some considerable time, however, ere funds will have become available for this purpose.

The European station at Kano is in a state of transition at present; new permanent buildings are contemplated for Government Officials. Towards the end of the year the site of the Baro-Kano Railway terminus was transferred to a point between the existing European station and the native town; new permanent buildings will have to be erected on the railway area; new European traders' sites have been taken up at the terminus, and new buildings are in course of erection thereon; and the final arrangement and placing of the Sabon gari—new African trading town—have yet to be determined.

During the year the changing of plans was the most marked activity at Kano.

The position of the soldiers' lines was altered during the year, and the population of the Government Schools at Nassarawa, two miles away, was materially increased.

With the increase of the alien population—European and non-European—and the greater area covered, the cost of necessary sanitary work and the difficulty in meeting it constantly increase.

The system of dry-earth conservancy practised is working well, and it is materially assisted by the daily removal of rubbish, suitable for manure, by the peasants of the district.

The water-supply, which is obtained from a stream, is not all that could be desired, so far as quality is concerned, but the condenser affords a sufficient supply of pure drinking water to the Europeans.

KATSINA.

A fine broad road, most of it fenced, runs all the way from Kano to Katsina. The rest-camps all along the road are particularly good, and the practice of placing the markets and caravansaries outside of the towns is increasing.

In the majority of instances of markets and caravansaries having been placed outside the towns, the principle has been adopted voluntarily by the natives themselves without any European prompting, and it has been adopted not on sanitary grounds, but in order that the numerous thieves of nomadic habits may be kept outside of the towns, and more easily detected and controlled. Many natives affirm that stealing has increased enormously in the country since the European Government put a stop to the more severe native punishments formerly inflicted upon convicted thieves, and in a country in which lock-fast doors and gates are generally conspicuous by their absence, and malefactors regard imprisonment neither with fear nor shame, and where severe sentences cannot be passed for theft, it becomes absolutely necessary to keep criminals out of bounds so far as possible.

As the boundary of the Katsina emirate is approached, the close cultivation, so characteristic of Kano, becomes less marked, and, although the agriculture of Katsina is of a high order, much fallow land and considerable areas of bush are to be noted everywhere.

The traveller cannot help observing the Emir's influence in the well cleared roads, the well maintained rest-camps, and the alertness of the District Headmen and of the Headmen of towns.

In many instances, the wells are outside of the towns and remote from sources of contamination; but the interiors of the towns, manure being in smaller demand, are not habitually kept quite so clean as are those in the heart of the Kano emirate.

The native dwellings are, as a rule, well built. This is particularly the case in the city of Katsina itself, where the houses of mud, most of them flat-roofed, are covered with a layer of gravel, rough sand and cement substance, which turns the rain wonderfully well. Particularly tough clay is procurable at Katsina, and the builders of the town are famous for their skill in working with mud.

The city of Katsina, where the Emir resides and near which is the chief European station of the emirate, is a clean one. It is swept out daily, and the

slaughtering ground, situated outside of the north-west portion of the wall, is kept commendably clean.

The market, which is inside of the town, is constructed, more or less, on the Kano model, and is kept clean and inviting.

The people are intelligent, courteous, and look prosperous.

There is a native prison, dark and rather over-crowded, but the prisoners are well fed and appear to be well looked after generally.

Deep salgas are in universal use. Water of fair quality is obtained from wells which run to a depth of two hundred feet.

The Emir himself obtains his drinking water from the station condenser, and many of his entourage habitually boil their drinking water. The Emir is a great tea-drinker.

A considerable area of land inside of the wall is given over to cultivation. The inevitable borrow pits are in evidence, and there is a fairly extensive marsh outside of the eastern gate.

The European station at Katsina is a small one. There are seldom more than four Europeans in residence, and they, together with their servants, 25 soldiers, and 2 non-native African clerks, with the women, children, etc., appertaining thereto, constitute the population. Situated about a mile to the eastward of the town wall, the station is roomy and not too closely populated. Water being apt to lie on many parts of the site during the rains, the houses have had to be dotted about irregularly to secure permanently dry ground. The thatched round mud huts of the soldiers are well built and well arranged. They constitute an admirable set of lines, and they are sufficiently far distant from the European quarter.

The roads within the station are broad, clear and regular, and everything points to constant care and active attention. The station contains a gaol run by the native administration, built of mud and having a flat mud roof. If more light and air were admitted and grated doors were fitted, the gaol would be greatly improved.

The Europeans occupy native-built houses.

The water supply is drawn from wells, is of fair quality, and enough of it is daily condensed to afford a sufficiency of drinking water to the Europeans and to the Emir. Inside of the fort, where nobody lives, there is a deep well, covered and fitted with a parapet, from which water of very fair quality is obtainable.

Conservancy is on the dry-earth system; combustible rubbish is burnt daily, incombustible, buried.

The Medical Officer has been recalled from Katsina, his services being more necessary elsewhere. His recall is greatly regretted by the Emir and the leading people, who thoroughly appreciate European medical assistance.

All along the road from Katsina to the boundary of Zaria Province—the boundary is less than a day's march from the city of Zaria—the well preserved high road and rest camps, and the alertness and courtesy of the Headmen and people maintain the well-deserved reputation of Katsina.

KABBA.

This southern province lies entirely to the west of the river Niger which forms its eastern boundary; on the north it is bounded by the Niger and by the Province of Illorin; on the west by Illorin and by Southern Nigeria; and on the south by Southern Nigeria.

The centre of the province is traversed by a hilly plateau, which, beginning in the neighbourhood of Lokoja, runs from east to west. This plateau forms a watershed which gives origin to several rivers. To the north and east the fall is towards the Niger, to the south towards Southern Nigeria. The hills are heavily wooded, and the dense undergrowth in the woods affords cover to numerous tsetse flies. The southern portion of the province is more hilly than the northern, the latter being undulating.

The indigenous population is entirely pagan, and is of various tribes. The population is estimated at 116,689—36,385 males, 47,799 females, and 32,505 children. This gives a density of just under 15 to the square mile, the area of the province being 7,800 square miles.

The people do a very considerable trade in produce with the trading firms at Lokoja.

The headquarter station of the province is near the town of Kabba. Kabba is not now such an important station as it was formerly. At the beginning of the last decade a company of soldiers was permanently stationed there together with the usual quota of European officers; but now there are as a rule only two Europeans in residence, and the soldiers have been replaced by a detachment of civil police.

A new site was selected for permanent buildings, and at the end of the year steps were taken to go on with them. When the permanent buildings for Europeans shall have been completed, the re-arrangement of the existing station will be proceeded with.

The new site has the advantage of being a good one in itself and, although within easy reach of it, of being a mile distant from the native town.

Clearing around the native town which had been carried out by the advice of Dr. C. E. S. Watson, resulted in a marked diminution of the tsetse flies which infest the region, but it was recommended that further thinning of trees should be effected, and that cultivation around the town should be restricted to short crops.

The neighbourhood is fatal to horses and to domestic cattle. The diminutive, semi-wild native cattle live all right, they being able to harbour trypanosomata without any apparent harm to themselves, but affording a constant nursery for the infection of tsetse flies.

From Lokoja to Kabba there is a fairly good road, at many parts of which tsetse flies are encountered, especially near streams.

The native villages along the road are all over-crowded and their surroundings are foul. Most of the rest-houses are too close to native towns, a particularly objectionable state of affairs where tsetse flies are so common. They ought to be rebuilt at the regulation distance, and their surroundings ought to be kept clear.

Sleeping Sickness is said to exist at the town of Kumi, opposite Baro, on the Niger.

BASSA.

During the year, Ankpa having been finally recognized as the headquarters of Bassa Province, the acutely required permanent houses for the civil and military officers stationed there were sanctioned, and towards the end of the year active steps were taken for their erection. Those houses are being erected on the site originally chosen uphill from the present station.

On the completion of the European buildings some re-arrangement of the existing official lines will be necessary.

Considerable additional clearing has been effected around the existing Hausa town, and care has been exercised to secure its expansion on proper lines.

Eventually, the improvements now being carried out at Ankpa will result in most grateful tempering of the local plague of chiggars to all concerned.

Some inevitable extra expense will be incurred in conveying water to the new European quarter; but this was always foreseen, and the amelioration of existence secured by the change will be worth the cost.

The broad road from Gbebe on the Niger, via Dekina, to Ankpa has been completed, and the most satisfactory result of its construction is that the traveller may now make the journey from the Niger to Ankpa and not observe a tsetse fly, unless he be specially looking out for it. This fact alone, apart altogether from political advantages, is quite sufficient to justify considerable expenditure in cutting broad thoroughfares through all tsetse fly areas.

From Ankpa to Bogana in the Benue the rest-houses along the road are good and well situated, and a particularly good rest-camp has been constructed at Bogana, on a prominence overlooking the river and the native town.

ILLORIN.

The Province of Illorin lies in the south-west corner of the Protectorate, it is bounded by the Niger and Borgu on the north, by Kabba on the east, and by Southern Nigeria on the south and west.

Its population is estimated at 191,427—53,799 males, 62,412 females, and 75,216 children under fourteen years old.

The people are of various tribes, Yorubas predominating. They are of mixed cult, forming a mixture of Paganism and Islam, the latter tending to expand at the expense of the former, and the province itself is the site of the debatable land where the wave of Fula conquest towards the south was finally stopped.

The northern extension of the Lagos Railway traverses the western third of the province from south to north, entering it in the vicinity of Offa, passing through the capital town of Illorin, and emerging from it at Jebba, on the Niger.

Over the greater part of the province horses and domestic cattle fail to thrive, nearly all succumbing to Trypanosomiasis.

As is the case over most parts of the country where tsetse flies are common sheep and goats often thrive quite well where cattle and horses cannot live at all. The stunted half-wild pagan cattle, which have acquired tolerance of the parasite, also thrive.

When Yellow Fever was active on the coast, in June, it being feared that the disease might possibly break out at Lagos, all possible steps were taken to

prevent the pest entering our Protectorate, via the railway, at Offa. Fortunately, Northern Nigeria can still boast that it has never harboured a case of Yellow Fever.

The tour of the Province of Illorin was made with special reference to the centres of Illorin, Offa, Jebba and Pategi.

Illorin, the capital of the province, is situated on the river Aza, where that stream follows a tortuous course in a general direction from south to north. At Illorin, in the month of June, the river varies from thirty to one hundred yards in breadth. Towards the end of the rains it becomes very much broader, and during the dry season it shrinks to a series of pools. During the rainy season much of the low-lying land in its vicinity is converted into swamps which are connected with the river. The land on both banks gradually rises in a gentle slope, which affords efficient surface drainage towards the river. The soil is light and porous, and permits rapid percolation, and the average annual rainfall based on the records of the six years 1905-10 is 54.43 inches.

Mosquitoes and sandflies are numerous and troublesome, while tsetse flies are plentiful in the surrounding country, and are sometimes encountered in the European quarter.

Illorin is usually divided into three quarters: (a) the official quarter, (b) the railway quarter, known as the Square Mile, and (c) the native town.

On the right bank of the river are situated (a) and (b), while (c) is entirely on the left bank.

The river thus separates the native town which runs along the river for several miles from the two European quarters.

No part of the native town approaches the official quarter within a mile, and it is sufficiently far removed from the railway quarter. In the official quarter, which is north of the railway quarter, are located the houses of the European Protectorate officials, quarters of native officials and police, and public buildings, including the provincial prison.

In the railway quarter or Square Mile are located the railway station, the quarters of railway officials both European and native, the telegraph office, and the premises of the European trading firms.

The native town, which formerly was surrounded by a large wall, is not laid out on any system, and its thoroughfares are narrow and tortuous. The wells are not properly protected, salgas are not in general use, much refuse of all kinds is observable everywhere, and the main market and the minor ones, which are all intra-mural, are not inviting.

In the official quarter conservancy is on the dry earth system and is working well. Fair water is obtained from a well, and the drinking water for Europeans is condensed, and the compounds are laid down in Dhub Grass. The official quarter has always been well looked after, for the Resident of the province is himself a medical man by profession and has always taken an interest in sanitary affairs.

The inhabitants of the Square Mile derive their water supply from wells and from rain water tanks. Steps have been taken to improve both, and steps have also been taken to improve the latrine arrangements, which showed much room for reform during the year.

Like many places which have recently been reached by the railway, Illorin is in a transition stage. Nobody knows what its dimensions are likely to be eventually, but there will be considerable changes in any case, and they require careful supervision.

Offa is situated five miles inside of the Northern Nigerian boundary, and is the first Northern Nigerian station on the northern extension of the Lagos Railway. Forming as it does a fairly large railway headquarter station, it is a place of growing importance. There are fourteen railway officials, of whom four are first class officers, in residence, in addition to the native staff, and the completion of a large locomotive workshop in course of construction will involve an increase in the number of European officials as well as in that of the staff of native artizans.

The only European official of the Protectorate in residence at Offa is the Resident of the division, and he, like the officers resident at Illorin itself, enjoys the boon of European quarters.

The station, like all those which have sprung up without immediate medical supervision, affords room for improvement. Fortunately all the necessary improvements are quite within the reach of existing possibility and resources. They have all been indicated and some of them are being carried out.

Horses live in the station and in the native town itself, but not in the surrounding district, while cattle are kept within the division about ten miles to the north of Offa.

The native town—population about 4,000—is not laid out on any definite plan. The market, although intra-mural, is kept fairly clean; the same thing applies to the thoroughfares, but, as is the case in many native towns, the outskirts are a common dumping ground for rubbish, and the peripheral long grass is used as a common latrine.

Offa is, however, receiving increased attention, and the end of 1912 will see considerable improvements there.

Jebba was formerly the capital of Northern Nigeria. It was deserted for Zungeru in 1902, and it shrank to insignificance until the advent of the northern extension of the Lagos Railway—which crosses the Niger at Jebba—raised it to a state of importance again. Until recently it was a town of the Province of Illorin, but now, for political reasons, is included in the large Niger Province.

At Jebba the Niger flows from west to east. The region of Jebba is now occupied very much in the same manner as it was in the old days, but the personnel is different. At Jebba the river is divided into two channels by a long island. The high ground on the south bank, commonly called Port Illorin, is occupied by the Resident of the division, by the main staff of the Lagos Railway northern extension, by railway employees, and by a native town. The island, formerly the headquarters of the Northern Nigeria Regiment, is now occupied by the bridging staff—that portion of the railway bridge which crosses the south channel is still under construction—and by a native town; and on the north bank, formerly known as North Camp, is a small native town.

Parts of the island and of the north bank are marshy; but the high situation of Port Illorin, its proximity to the river, and its porous soil admit of free disposal of water by surface drainage and by percolation.

Mosquitoes are numerous on the island and north bank. Sandflies are plentiful everywhere, and tsetse flies, although not encountered on the high ground of Port Illorin, are numerous along both banks of the river.

At present sanitation is being well supervised by the Medical Officer from Southern Nigeria, who is in charge of the railway personnel. Eventually there will probably be considerable permanent extension of both the European and native quarters, and this is being watched by the Resident of the Division, who invokes medical and sanitary assistance from time to time.

Jebba has never been by way of enjoying a reputation as a health resort; and its sanitary condition will always call for considerable watching.

Pategi is a Nupe town on the right bank of the Niger and is situated on rising ground some distance back from the river. The left bank of the Niger, opposite Pategi, is cut by the mouth of its tributary, the Kaduna, which joins it there.

Pategi contains about 4,800 inhabitants. It consists of mud walled compounds which are kept commendably clean; but long crops have always been grown between the compounds, and this, combined with the filthy condition of the roads and surroundings and of the central market keeps the town in an unsavoury condition.

Inviting water is obtained from wells running down to a depth of fifty feet, but the wells lack parapets. The Resident of the Division resides at Pategi, and he has been carrying out some acutely needed reforms during the year.

In the Province of Bauchi, which is famous for the great variety of languages and dialects spoken by its Pagan inhabitants, the chief centres of interest are the mining area, whose present centre is on the highlands around Naraguta and Bukuru, the headquarter town of Bauchi, which is one of the cleanest and most orderly towns in the Protectorate, the emirate of Gombe, and the emirate of Nafada, each of which has a headquarter town of the same name.

During the year the temporary headquarter site on high ground above Naraguta was occupied, temporary houses having been erected thereon for the Government officials. Considerable extensions and alterations were carried out at the native town and on the old official site, and mining activity was in full swing at the surrounding mining camps and settlements.

Here it may be well to point out that since the beginning of the serious exploitation of tin an unprecedentedly large number of unofficial Europeans has been entering and accumulating in the country; that it is impossible to keep accurate account of the Europeans who enter and leave the country, or even the individual provinces; that a large number of those Europeans are migratory; that the mining community is in great part attended by its own unofficial medical practitioners, and that it is in consequence practically impossible to obtain accurate vital statistics of the unofficial European population.

Constant sanitary supervision and activity are called for around Naraguta, and the Resident and his political colleagues have been actively sympathetic in such matters.

The temporary housing at Naraguta is by no means all that could be desired; but steps have been taken to improve it, for although Naraguta has not been fixed as permanent headquarters, there is no reason why the quarters should not be at least weather-proof.

Bauchi, Gombe, and Nafada received attention during the year in addition to numerous intermediate places.

A new site was selected as a station for the Nafada garrison at a Pagan town called Dadia, near the border of Muri Province, but unfortunately after the completion of the year the water supply was found to be inadequate.

At Birnin Kebbi, the headquarters of the emirate of Gando, sites were selected for new permanent houses for all the Europeans not already so accommodated, to wit, the Assistant Resident and the military officers. Arrangements were also made to move the whole station further back from the immense swamp which it now overlooks, provided the yield of water from the well arranged to be sunk at the site of the proposed new fort was found to be adequate.

Arrangements were also made for the carrying out of various reforms in native towns in Gando, Kontagora, and Sakaba.

Lokoja, Baro, Minna, Zaria and Kano were repeatedly visited during the year.

The renovation of the native town at Lokoja was kept in slow but constant progress. The progress has to be very slow as it is a political impossibility to move quickly there.

Throughout the year tentative attempts were made to secure a new water supply for Lokoja, but the end of the year still found them in the experimental stage.

The inevitable harassing of the people involved by the carrying out of the necessary reforms in Lokoja native town naturally irritated the people, a good many of whom left in consequence, and the state of affairs called—and still calls—for the exercise of tact and patience on the part of the Cantonment Magistrate. Many of the inhabitants of Lokoja would be a good rid-dance if they were to clear out, but unfortunately it is useful rather than useless members of society who are apt to go.

At Baro the congestion of the horse shoe was greatly relieved by the construction of a new native town out of the horse shoe itself and up the line therefrom. The permanent features of Baro have not yet been finally determined, and will not be until what time it may be accurately known what its railway and commercial importance may be.

At Minna sites were selected for new permanent residences for railway officials. The extension of the new native town was proceeded with, and the water supply continued to receive attention.

The fate of Zaria was in a state of uncertainty, but very considerable extension of the station was effected. Several new permanent houses were built, the station yard was moved, and new buildings were erected in connection therewith, a new native town and new soldiers' lines were planned, and a new prison was designed. Several water schemes were discussed, but the final water supply has not yet been arranged, and so far nobody has the slightest idea of what the final requirements will be.

The end of the year found sites being selected for permanent quarters for railway staff at stations all along the Baro-Kano Railway.

With the end of the year the undesirable dual control of Burutu Beach came to an end, an arrangement having been made by which the administration of Southern Nigeria assumed sole control.

Segregation camps for Lepers were established during the year at Maidugari and Geidam in Bornu and at Sokoto.

At Kano, on the news getting about that Lepers were likely to be segregated, many Lepers bolted out of the province forthwith.

At Kano it has been made compulsory for every Leper to wear a distinctive garment by which he or she may be known to be a Leper.

All over the Protectorate the native authorities, Pagan as well as Mohammedan, have been seriously approached touching Leprosy, and the extensive segregation of Lepers is likely to become general ere long.

During the year the Royal Army Medical Corps sergeant in residence there went to live in a quarter about one hundred yards from the Sleeping Sickness Camp near Zaria.

The Sleeping Sickness Camp is well situated on rising ground across the Kubani river south of the European station of Zaria. The patients are well housed in a walled enclosure. They are maintained at Government expense, and the small number in residence so far have been quite contented to live there under medical supervision, control and treatment. But it is doubtful whether central isolation at Zaria or local isolation in fly-free areas in their own provinces be the better plan to adopt in the management of patients suffering from Sleeping Sickness. So far as this Protectorate is concerned, local isolation seems on the face of it the better plan. The alleged foci of Sleeping Sickness are not confined to one region, on the contrary, they are dotted all over the country in different and widely separated provinces; and in many cases conveying the patients across country to Zaria means taking them through fly-belts in which the flies have not so far been inhabited by the human trypanosoma. The majority of Sleeping Sickness foci, actual or suspected, are in Pagan districts. The Pagan as a rule detests going far from his native village. He is very liable to die of nostalgia if forcibly transported, but in many cases he has practised isolation for other transmissible diseases, and he is quite likely to fall in with the principle of segregation provided it be carried out in his own locality.

From the point of view of economy also the plan of local segregation is better. There is some chance of local segregation camps being self-supporting, or at least locally supported; but it is a very different matter to expect a parochial Pagan to contribute to the upkeep of his sick relations at Zaria, a place of which he may never have heard even the name, much less become acquainted with the situation.

The problem of the segregation of cases of Leprosy and of Sleeping Sickness, together with the treatment of sick natives in hospitals, raises a very big question. It is quite true that it is a moral obligation resting upon the humanity of the Administration to bring modern science to bear against the diseases which afflict the natives; but unless this duty be carried out with adequate forethought there will soon develop in this financially poor country an institution entirely alien to it in the shape of a costly and paralysing poor law.

The natives of this country have always been kind to their own, and have looked after their own destitute and helpless relations; but they are as a rule keen traders, and their personal pride does not take the form of being ashamed of accepting charity, and when they find that if they themselves plead poverty, or quietly efface themselves, the Administration will support them or their relations during sickness, they will leave the Administration to bear the expense, as likely as not making a profit by selling to the Administration for the use of their dependants the food which they ought themselves to be supplying free.

Apart altogether from the principle involved the native can feed and house the sick equally well at a much lower cost than the Administration can,

for there is not a market in the country where the native does not habitually underbuy any white man, official or unofficial.

At all the typical places mentioned above in connection with tours and at many others, conferences were held with the leading natives touching sanitation and sanitary reform. In practically all cases the local political officers took part in those conferences.

The matters discussed and explained were mosquitoes and flies, the diseases carried by them and simple methods of keeping them down; diseases conveyed by water, and the safe-guarding of water supplies; Small-pox and vaccination; Leprosy and segregation of Lepers; Venereal diseases, their unsuspected ravages, and obvious administrative means of diminishing them; and the burial of the dead. The question of the burial of the dead was only brought up among the Pagans of the south. It has not seemed expedient so far to touch upon this subject among the Mohammedans, for it dovetails with their religion, and for a supposed Christian to advert to religious subjects among good class Mohammedans is quite as bad form out here as it would be at home for him to refer to religious subjects in general society.

Even the question of vaccination has to be handled very gently in certain regions, the denizens of which believe that the vaccination scars are the marks with which the white man brands his slaves.

Encouraged therein by the Resident, the Emir of Kano issued a proclamation to his people in which he enjoined certain necessary sanitary practices. Other Emirs, beginning with the Emir of Katsina, followed suit, and towards the end of the year cheerful evidence was forthcoming over the country that such proclamations were common talk.

The voluntary practice of making the markets extra-mural is increasing in other regions besides Katsina.

All over the country people are becoming alive to the necessity of keeping the surroundings of their wells clean, and parapets are noted in many places where they were not to be seen formerly; but of course this reform is patchy in its incidence, pattern towns and communities being specially noticeable here as they are in most other parts of the world.

During the year an attempt was made to fill in the swamp at Baro with sand pumped by the dredger, but it proved abortive and the dredger did not proceed to Ibi.

The distribution of mosquito-proof rooms at headquarters and to out-stations proceeded so far as material would allow.

Considerable attention was directed to the headquarter prisons at Zungeru and Lokoja, with a view to increasing their accommodation and diminishing overcrowding, and sanction was given to the principle of letting the Provinces retain their own long sentence prisoners.

Grants were given to certain out-stations to cover the cost of the labour necessary for keeping them cleared, the practice followed having been only to extend such grants to out-stations having no gaols, and therefore no prison labour available.

(II.) PREVENTIVE MEASURES.

MALARIA.

During the year 1,636 cases, not necessarily 1,636 separate persons, were treated for Malarial Fever—207 European and 1,429 native cases, and 11 natives died.

Many of the native cases were probably recurring attacks and not fresh infections, for so soon as he has recovered from an actual attack the native takes his departure, and there are practically no natives—servants excepted, in those instances in which Europeans systematically dose their servants—who are habitual quinine takers.

The figures given above probably include no native children and very few women, for they chiefly refer to adult male employees—African non-natives, soldiers, police, etc.

At Lokoja, Baro and Zungeru, in addition to the regular oiling of puddles and water holes which cannot either be drained or filled in, the stations and native towns are regularly visited by the local health officers and sanitary inspectors who pay special attention to movable receptacles, inside and outside of the compounds, which hold or are liable to hold water.

At all out-stations where Medical Officers are posted, regular consignments of kerosene are received for oiling purposes, and as already mentioned, grants are given for clearing purposes to out-stations having no prison labour.

The clearing of water courses is carried out at stations so far as is possible with the supply of labour available, and this is well done at the three head-quarter stations in addition to Kano, Zaria and Minna.

The principle of planting only short crops near human habitations and of discontinuing the practice of growing guinea-corn in compounds is steadily spreading, and in quite a fair number of native towns people who have puddles inside of their compounds begin to find that they are apt to get themselves disliked by their own big men.

An active crusade is maintained against the construction of new borrow pits. It is an offence to construct them within the boundaries of stations where they are always filled in, and a good many of the more enlightened and active native headmen are beginning to disown the construction of such pits in their own towns.

An increasing number of wells over the country are without puddles round their mouths, and many more wells than was the case formerly are being dug outside of the towns.

An ever increasing proportion of the inhabitants of native towns is adopting the practice of keeping water storing vessels covered, and many also make a habit of emptying such vessels daily and refilling them.

Rain water tanks are protected by gauze, and where the gauze is defective are oiled as well.

The use of the mosquito net is universal among those Europeans who have not secured mosquito-proof rooms, and its use is extending among the natives. Many natives use mosquito nets for the same reason as they smoke cigarettes—to imitate the European. This is particularly the case among African non-natives.

The great majority of European officials have had mosquito-proof rooms issued to them; but such rooms are often only nominally mosquito-proof from the destruction of the wood by white ants and from its warping in the dry season.

It is quite exceptional to encounter an European who does not take a daily five grain dose of quinine, but too many only take it in tabloid form.

The increasing number of permanent quarters is decreasing the incidence of mosquitoes traceable to dark thatched interiors, and the more

extended practice of keeping European residences more distant than a mosquito flight from native quarters is lessening the risk arising from the proximity of native children, while the adoption of large compounds keeps diluting the community of native servants within the various European quarters.

BLACKWATER FEVER.

This complication accounted for the death of six Europeans within the Protectorate during the year.

TRYPANOSOMIASIS.

During the year there were 27 cases of Trypanosomiasis known, and two of them ended fatally.

The Sleeping Sickness camp at Zaria has already been mentioned. The clearing of bush likely to afford cover for tsetse flies is systematically carried out at all stations, and certain high roads are widened where they traverse fly-belts.

During the year Sleeping Sickness was alleged to be in existence at Jigindi, a town in the Province of Nassarawa. Dr. Parsons, the Medical Officer at Keffi, went to investigate the disease. The history of several cases which had ended fatally were, as related, very suggestive of the disease; but the parasite could not be observed in the blood of any of the cases examined by Dr. Parsons. However, the people being willing to move Dr. Parsons laid out a new town for them in a fly-free area in the vicinity, and left them preparing to begin the erection of their houses on the new site.

But it is very rarely the case that the people concerned will consent to take such a course. A certain amount of Mohammedan influence is at work in Jigindi.

From the point of view of public health, Sleeping Sickness is probably the most difficult problem in the country. All the intelligence collected up to date leads to the conclusion that the disease has always been endemic. Most intelligent natives in all parts of the country—many of them who have never been near an alleged Sleeping Sickness locality—know the disease well by reputation, and can, roughly, retail the symptoms of it; cases are often reported; and, more often than not, when a Medical Officer goes to investigate, he cannot diagnose a single case. Often, for example, old cases of paralysis, together with any case of debility which may be attended by lethargy, are apt to be mistaken for Sleeping Sickness and reported as such, chiefly because the reporters—in many cases quite honest and straightforward—have heard about the disease, without ever having seen a case.

Again, more frequently than is suspected by most, a certain village, having a grudge against another one, will spread a report that the people in the other village are dying of Sleeping Sickness, simply in order that those people may be stirred up by the white man.

Lastly, where Sleeping Sickness has been in existence once—no matter how long ago—the people retain a traditional and wholesome dread of it, and they go on ascribing any obscure malady to that disease for generations after it has died out.

Nevertheless, as Sleeping Sickness undoubtedly does exist in different parts of the country, it is impossible to discount any rumour of its appearance,

however nebulous; but the nursery cry of "wolf" being so frequently repeated, and human nature being what it is, there is always the possibility of a genuine outbreak being ignored some day.

The presence or absence of Trypanosomiasis in a given locality is not a state of affairs which can be definitely affirmed or denied after a brief investigation; and, unless it be in the vicinity of his station, no Medical Officer can afford the time—consistently with the performance of his routine duties—to sit down for a prolonged period in one circumscribed region. It follows, therefore, that the first desirable step to take in dealing with the disease is to tell off one Medical Officer whose whole time may be devoted to the investigation of such rumours.

YELLOW FEVER.

As already stated, Yellow Fever is unknown in the Protectorate. *Stegomyia Fasciata* is not uncommon along the courses of the great rivers; *e.g.*, it constituted 22 per cent. of the mosquitoes caught at Lokoja during the year; but it is not plentiful at the northern and inland stations, where it is seldom observed during the dry season.

All passenger steamers are regularly inspected at Lokoja and at Baro; and this inspection, together with the putting of Burutu Beach entirely under the sanitary authorities of Southern Nigeria, constitutes the first line of defence against invasion by the disease.

Offa, where the railway from Lagos has its first station in the Protectorate, has been marked as a danger spot; and, at the first rumour of Yellow Fever on the Coast, Offa will always receive immediate attention. All other necessary steps are covered by the routine precautions taken for the suppression of Malarial Fever.

FILARIASIS.

No case was returned during the year as Filariasis. Seven European cases were returned as Lymphangitis; 186 native cases were returned under Diseases of the Lymphatic System; 20 European and 225 native cases were returned as Pyrexia of uncertain origin; and 2 native cases were returned as Nematoda. Having regard to the known prevalence of Filariasis in the Protectorate, it is fair to suppose that many of the above-mentioned cases were examples of it.

Again, 4 European and 1,571 native cases were returned as Effects of Parasites. Many of them might probably, with justice, have been divided between the Filariæ and the Intestinal parasites.

RELAPSING FEVER.

Three native cases were returned as Relapsing Fever.

EPIDEMIC DISEASES.

The Protectorate remains free from Plague and from Cholera, there being no record or tradition of the existence of either.

CEREBRO-SPIINAL FEVER.

One fatal native case of this malady was reported.

SMALL-POX.

There were 80 cases treated, with 14 deaths, amongst natives.

One European official had a severe attack but recovered.

This endemic disease, which assumes the epidemic form annually, is very prevalent throughout the Protectorate; but, as things are at present, it is impossible to compile accurate statistics of it. It generally begins to show itself in the second half of the dry season and, as a rule, dies down when the rainy season has seriously set in.

During the year 5,494 vaccinations were performed, and 3,879 of them were observed to be successful.

The fair number of successes recorded in the dry hot interior of the country continues to demonstrate the efficacy of powdered lymph.

Constant efforts are directed towards the breaking down of the prejudice against vaccination which is harboured by many natives.

DYSENTERY.

There were under treatment for dysentery during the year, 26 European and 603 native cases; 37 of the latter were fatal.

This disease is endemic everywhere, one of the best proofs of its endemicity consisting in the fact that there is hardly a native language in the country which does not possess a specific term for it.

Most stations have now condensers, and the great majority of Europeans are regularly supplied with a sufficiency of condensed water; while, when absent from stations where there are condensers, they habitually have their water boiled.

All possible steps are taken to induce the natives to safeguard their water-supplies by applying parapets to the mouths of their wells, by digging new wells in suitable places, and by closing wells which are known to be badly contaminated.

Further, no opportunity is missed of making the natives understand the dangers of contaminated water and the method of escaping them. In this connection they are always impressed when it is pointed out to them how many natives of the towns along the highways suffer from dysentery, and how few European travellers using the same roads suffer from it, although both drink water from the same wells or rivers; and they grasp the truth at once when they hear that the white man escapes by boiling his water, the fact that the boiling of water is the first duty of the white man's cook, on arriving in camp, being known to most of them either by observation or by gossip.

The expression "to cook water" is taking its place in the leading languages of the country; and this in itself shows that some progress is being made in the direction of reform.

ENTERIC FEVER.

One case was recorded in a native.

INFECTIVE ENTERITIS.

Three cases were treated in natives.

DIPHTHERIA.

One fatal native case was recorded.

TETANUS.

Two fatal cases were treated, both of them in natives.

CHICKEN POX.

Ten cases were treated in natives. This disease is not nearly so common in Northern as it is in Southern Nigeria.

COW-POX.

Seventeen cases were treated in natives.

INFLUENZA.

There were 39 cases of influenza under treatment, all in natives, and 6 were fatal.

PNEUMONIA.

This disease was treated in 130 natives, 37 of whom died. There is very little doubt that Pneumonia, as seen here, is generally epidemic. Isolated cases often seem to occur; but, if their immediate past history could only be obtained, it would probably be found that they had spent some time in a crowded hut shortly before. The natives are as tolerant of a close atmosphere as they are intolerant of cold; overcrowding is not the least objectionable to many of them; and the number who will not hesitate to don the unwashed clothing of dead friends or relations is not small.

The disease, again, often appears to run a phenomenally short course, compared with what is observed at home; for example, it is by no means an uncommon experience to diagnose double Pneumonia in a man one morning and to be unable to find any physical signs the next day, no expectoration or cough having been noted in the meantime.

RHEUMATISM.

Cases of this disease were treated in 11 Europeans and 389 natives; three cases among the latter were fatal.

The wearing of tight cotton clothing among soldiers, police, servants of Europeans, and African non-natives undoubtedly ministers to the development of this affection; but, with the present limitations of observation, it is impossible to say whether or not the victims be in smaller proportion among the indigenous natives who have not come under direct European influence.

NEW GROWTHS.

All cases recorded under this term occurred among natives; there were 25 of them, and one was fatal. It is not stated whether all or any of them were malignant; probably none was, for it is difficult, if not impossible, to meet a Medical Officer who has ever diagnosed malignant disease among the indigenous natives.

ENDEMIC DISEASES.

SYPHILIS.

The cases treated were 531, of which 8 were fatal.

GONORRHCEA.

Of this disease 1,452 cases were treated. The cases of those two diseases which come under treatment are but as a drop in a bucketful of water. Knowledge, together with private conduct and public action—which must neither be fussy nor meddlesome—based thereon, affords the only means of effectually dealing with this scourge.

One very effective administrative means is having markets extra-mural; while another is not to regard it as contrary to British ideas of freedom for Headmen to forbid strangers to enter their towns.

LEPROSY.

Of this disease only 84 cases were treated. The number of lepers is very large, but the day for an accurate leper census is not yet. Leper Segregation Camps have already been mentioned. So far they are in their infancy, and the wise policy appears to be to treat them, in the first instance anyhow, as native institutions and so not to arouse the mistrust of the people; therefore the doctor must not show his hand until they shall have become one of the common administrative features of the country. For example, the Leper Settlement at Sokoto is wrongly situated and no medical man would sanction its close proximity to the town; but the Sarikin Musulmi has pointed out that it is impossible to make a successful beginning under any other conditions.

HELMINTHIC DISEASES.

ANKYLOSTOMIASIS.

No case of this disease was recorded.

TOENIASIS.

Of this disease, 45 cases were treated. This again is no indication of the prevalence of the disease. Most, if not all, of the cases treated were in

Government employment. The ordinary native will not seek treatment for such a disease, unless it make life a burden to him; and, then, as a rule, he will invoke the assistance of a native medicine man; if, on the other hand, he be in Government employment, he will only come to Hospital if he see the certainty of a few days off duty on full pay.

BILHARZIA.

Cases of this disease were treated in 6 natives. It is common in many places; and there a good number of cases could be recorded any time by a systematic examination of a group of people.

TRICHINOSIS.

No cases were recorded.

GUINEA WORM.

Guinea Worm was returned in 82 cases. The disease is really very common, as common as Dysentery in many places. Travellers have only to recollect how often they have been inconvenienced by carriers falling out on the march on account of it, to realise how widely spread the disease is. But the native understands how to get the worm out by gradually winding it round a piece of rag and by keeping the place moist, and he is quite alive to the danger of breaking it.

It is always impressed upon the native that care of his wells and of his drinking water will save him from Guinea Worm, just as it will from Dysentery.

(III.) GENERAL MEASURES.

SEWAGE DISPOSAL.

Last year on this subject the following statement was made: "No water system for the disposal of sewage exists. Earth closets and latrine trenches are the methods used for the disposal of excreta at all stations. At Lokoja and Baro the contents of closet pails and buckets are thrown into the Niger; at all other stations they are trenched. The stools in the latrine trenches are daily covered with earth; only daily because it has been found so far that the great majority of natives will not themselves immediately cover their own dejecta. They are continually warned about this, and when caught are proceeded against, but most of the offenders escape."

This statement still exactly describes the state of affairs. Lokoja continues to be the only station in the country at which earth closets are provided for all, including the population of the native town. The day of this being true, however, is rapidly drawing to a close. To make earth closets a success in Lokoja native town demands an expenditure on labour and supervision which is prohibitive, and the solution of the problem will most probably be found in a system of private salgas in the compounds, public salgas along the river border of the town, and restriction of wells to the slope of the hill above the town.

The extension of the use of the salga or tumburi under European supervision of its situation is destined to solve the problem of the sanitary and

economical disposal of excreta satisfactorily in many places. This is particularly true of railway stations. As in all tropical countries is the case, native passengers arrive a long time before the train is due to start; children of nature, it never occurs to them to defer any natural call until a more convenient season. If places of public convenience be far removed they will not use them. Their numbers render sufficient earth closets impossible, and it is quite out of the question to have open latrine trenches close to the stations, therefore salgas, each one of them covered by a round hut, in the vicinity of each station constitute the only solution of the difficulty.

It is hoped that eventually this system of salgas for the use of all classes and races of natives will be established at all suitable stations, *i.e.*, at all stations where the subsoil water is not so near the surface as to convert the salgas into wells, and where salgas can be established without contaminating properly placed wells.

Head carriage continues to be the means of transporting buckets and pails from the earth closets to the places where their contents are disposed of at all stations except Lokoja, Zungeru and Kano. At Lokoja handcarts are still used; at Zungeru trolleys convey the buckets along a portion of the old tramway which has been left for the purpose to trenching pits a considerable distance from the town; and at Kano bullock carts are used.

A direct sanitary service in the shape of a gang of sanitary labourers with its headman and a Sanitary Inspector exists at the three stations of Zungeru, Lokoja, and Baro respectively. The Sanitary Inspector at Lokoja being the only one of the three Sanitary Inspectors who can read and write, Lokoja remains the only station in the country at which the daily sanitary report can be given otherwise than verbally. But the Sanitary Inspectors at Zungeru and at Baro are natives of the country itself.

At all other stations the disposal of excreta is, more or less, an affair of local arrangement. It is under the control of the local Medical Officer where there is one, and the individual cost, if any, varies with the different places and local accidental circumstances.

At Kano, Katsina and several other stations in the north much refuse which can be used as manure is regularly taken away by the neighbouring country people for use on their farms.

At some native towns public salgas are being constructed for the use of the poorer classes who cannot afford to construct such conveniences for themselves and for strangers visiting the towns, the classical example of this being the public latrines at Kano market.

DISPOSAL OF REFUSE.

The general rule aimed at in the Protectorate is the burning of combustible and the burying of non-combustible rubbish. This principle is particularly well carried out at Zungeru, where the incinerators continue to work very well; and it is the intention ere long to secure the construction of similar incinerators at other stations.

The practice is followed fairly successfully at most stations. At Lokoja a certain amount of combustible rubbish continues to be thrown into the Niger along with the non-combustible, and the plan of burning and burying continues to find extending favour in the more advanced native towns.

WATER SUPPLY.

At Lokoja the water supply continues to be derived from the Niger and from wells. A certain amount of excellent water is also obtained from the face of Mount Pati, just below the edge of the brow; but so far this supply has been strictly limited in amount. A large station condenser affords a sufficiency of pure drinking water for the hospital, for all Europeans, and for the needs of the soda water factory.

At Baro the reservoir at the back of the horse-shoe still collects enough of water from below the brow of the plateau for the requirements of the station. There also water is condensed in sufficient quantity for the hospital, the Europeans, and for the soda water factory.

Zungeru continues to draw its water supply from the Dago which is for this purpose dammed above the cantonment; but when funds can be found for the necessary plant, perhaps the finest water supply in the Protectorate can be obtained by pumping from the Kaduna, where it rushes through a rocky gorge after having passed over a succession of falls some distance north-west of the station. The station condenser yields a liberal allowance of drinking water for the hospital, soda water factory, and for all Europeans.

At the above-mentioned three stations, and at several others besides, the water supply is supplemented by rain water collected from the roofs and stored in iron tanks.

At the outstations, including Kano and Zaria, at most of which there are condensers, the water supply is obtained from the usual sources, *i.e.*, from wells, from springs, from streams, or, in the dry weather, from water holes in the beds of streams. The water used for drinking purposes in the gaols at Zungeru and Lokoja and in some provincial gaols, as well as in the various native hospitals, is boiled.

Throughout the rest of the country the natives obtain their supply from wells or from any natural source which may be available.

DRAINAGE.

The country is characterized by a light porous soil which permits ready percolation. Most stations have sufficient elevation to permit easy disposal of their surface water, and drainage takes the form of natural water courses, and where necessary of trenches cut towards them.

Most native towns have no drainage system at all beyond that of unassisted nature.

CLEARANCE OF BUSH, UNDERGROWTH, ETC.

The normal clearing which is carried on all through the rains at most stations is supplemented by financial grants where such are absolutely necessary. At most stations fire supplies an easy method of clearing after the dry season has really set in. There is a small number, however, at which the bush is never dry enough to burn, but gradual evacuation or simple moving of the sites is slowly diminishing them. Trees are not sacrificed if lopping of their lower branches be sufficient for sanitary purposes, and this thinning for sanitary purposes sometimes improves the appearance of the place, *e.g.*, few people had any idea of the beauty of the Dago, where it passes through Zungeru until clearing operations had been carried out in 1909.

The process of laying down dhuh grass in stations is gradually being extended, and the same thing holds good for the cultivation of short crops only at the peripheries of the native towns.

(B.) MEASURES TAKEN TO SPREAD KNOWLEDGE OF HYGIENE
AND SANITATION.

Much useful knowledge is imparted to the people by the Medical Officers in their daily rounds, particularly at Zungeru, Baro, and Lokoja, by the local Health Officers in the course of their regular visitations of the stations and native towns adjoining.

The Medical Officers at out-stations tour their districts when they can get away from their stations, and in the course of such tours they convey much sanitary enlightenment to the places visited.

During the tours of the Sanitary Officers, when they are accompanied as they generally are by the political officers concerned, Emirs, together with their Alkaljis and Sarakuna, or District Headmen with their Sub-Heads, are summoned by the Residents concerned to conferences with themselves together with the Sanitary Officers. At such a conference the Sanitary Officer goes into elementary sanitary matters, selecting cases in point from the town at which the conference is being held. The subjects generally dealt with have already been enumerated in the first part of this report. The Resident, who generally knows the people well, together with their limitations, acts as assessor and tells the Sanitary Officer when, in his, the Resident's, opinion, the audience has had enough, at which point a full stop is come to. Some of the native authorities voluntarily request that the main points brought forward may be reduced to writing. This fact, together with the pertinent questions asked, may be taken as presumptive evidence of an intention to take action. In the course of such visitations the District Headman generally accompanies the Resident and Sanitary Officer through all the towns in his district which they visit.

Conferences are only held at one town in each district, the Headman calling all his Sub-heads in for the purpose. At the other towns in the district the town is merely inspected in association with the Resident, District Headman, and the Headman of the town concerned. To hold conferences with small people would simply be to cheapen such functions.

A certain amount of elementary sanitation is taught at the Government Schools at Kano. This course of instruction is about to be extended, and the subject will be taken up later at the new school at Sokoto as well.

There is no doubt that eventually much useful and fruitful hygienic knowledge will filter through the country from the schools, in addition to which a new class of sanitary functionary of the right stamp will spring from the same source.

(C.) RECOMMENDATIONS FOR FUTURE WORK.

1. To endeavour to ascertain what is to be the destiny of Zungeru. Whether it be to remain a headquarter station, or to fall to the rank of a provincial headquarters. If it be to remain a headquarter station and retain its present or an increased population, to push for the erection of more European quarters and for the repairs necessary to the existing ones.

For a considerable time funds have not been available for the upkeep—the proper upkeep—of the existing buildings on the ground of the early move

of most of the garrison and a considerable portion of the civilians to some place elsewhere, and the result is that many of the quarters are neither sanitary nor comfortable, many of the roofs being infested by bats, together with the stinking results of the activities of those vermin, and the floors of some of the bungalows being positively unsafe.

To secure an adequate supply of rest-house accommodation at Zungeru. The amount of this sort of accommodation has been hopelessly inadequate for some considerable time. The permanent rest-house was annexed as ordinary station quarters some time ago. Since the opening up of the mines, the extension of commerce, and the advent of the railways, numerous private travellers have kept arriving at Zungeru and have been in the habit of remaining there for longer or shorter periods. They have occupied the rest-house accommodation provided exclusively for Government officials who are obliged to visit Zungeru, and the result is that it is not unusual for officers to arrive at Zungeru and to find the rest house accommodation entirely annexed by unofficial strangers, and to be obliged to seek quarters in houses of brother officers, normally overcrowded, to the mutual discomfort of each.

To secure increased accommodation for those members of the native clerical and artizan staffs who are entitled to quarters. Very great difficulty is found in supplying the smallest accommodation to those officials as things are at present.

To aim at transferring the source of the Zungeru water supply from the Dago to the Kaduna.

To secure permanent quarters for those British N.C.O.'s who are now occupying native-built huts of mud in the centre of the capital.

2. To endeavour to secure an irreducible minimum of furniture for the permanent houses, and a certain amount of furniture for those officers in bush huts at out-stations who have no furniture other than their own private camp equipment.

3. To continue to represent the necessity for greater privacy in permanent quarters. This is the question of giving as many people as possible houses to themselves.

4. To aim at having all mosquito-proof rooms constructed entirely of metal and sent to out-stations in sections sufficiently small to secure their handy transport and their arrival intact at their destinations.

5. To have standing condensers at all stations on the railways and on the main rivers, reserving the small portable condensers for those stations to which transport is effected by road with carriers or pack animals, thus securing a necessary increase of the output of condensed water at a relatively smaller cost of labour and of fuel. To have the number of spare parts normally sent out with condensers increased.

6. To keep the principle of laying down dhub grass at stations extending.

7. To secure more floor, site, and air space per head in the prisons, both central and provincial.

8. To keep constantly in view the keeping up of the minimum distance separating European from native quarters, the maintaining undiminished the

size of European compounds and the application of improved native salgas to some of the Sabon Gari.

9. To recommend the increase of the regulation area of European traders' residential sites at new places; the artificial inflation of the ground values of such sites tending to put a premium on overcrowding.

10. To press on the reformation of Lokoja native town at such a rate as may be consistent with political expediency.

11. Not to lose sight of the marshes at Baro and Ibi; but in the event of the dredger finally failing to devise some other means of dealing with them.

(Signed) M. CAMERON BLAIR,

Senior Sanitary Officer.
